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Vol. XXV, No. 1 JANUARY, 1936

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

TRADE MARK

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THE 84th ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION WILL BE HELD IN DALLAS, TEXAS, 1936.

The 1936 Meetings of the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy, Conference of Pharmaceutical Association Secretaries, of the Pharmaceutical Law Enforcement Officials and the Plant Science Seminar will also be held in Dallas, Texas.

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E. F. KELLY, Secretary,
2215 Constitution Ave.,
Washington, D. C.

SOME PHARMACEUTICAL EVENTS OF 1935.

See proceedings of the AMERICAN PHARMACEUTICAL ASSOCIATION, of the Council and of the House of Delegates. Also, the Historian's report and reports of the sections, conferences and related associations.

The U. S. Pharmacopœia XI and National Formulary VI were completed in 1935 and will become official in 1936.

The Pharmaceutical Abstract Section was added to the JOURNAL, beginning with the March issue.

The AMERICAN PHARMACEUTICAL ASSOCIATION through its delegates contributed to the programs of the American Association for the Advancement of Science. The papers of the A. PH. A. sections added to the year's research. Among these a few of many important researches may be mentioned without making comparisons with those not included here: Articles contributing to the U. S. Pharmacopœia and National Formulary; Studies on Drug Action and Drug Extraction; Treatment of Cyanide Poisoning; Studies on Thyroid Assay, Trichlorethylene, Barbiturates, Saliva Tests, Antidotes, Aconite, Digitalis, Pharmaceutical Studies of p_H, Enteric Coatings, etc., etc.

The National Council on Pharmaceutical Practice was organized as an activity of the ASSOCIATION.

The Pharmacy Exhibit has been placed in the Rosenwald Museum, Chairman H. C. Christensen presented an historical record of the important event.

The late Frederick B. Kilmer provided a $3000.00 trust fund, the income to be awarded by the A. PH. A. for rewarding meritorious work in pharmacognosy.

The Ebert prize for 1935 was awarded to Marvin J. Andrews for his work on "Determination of Reasonable or Permissible Error in Dispensing." The Remington Medal was awarded to Samuel L. Hilton for outstanding service to pharmacy.

The Badianus Manuscript, a rediscovered Aztec Pharmacopœia, 1552, was the subject of a paper by Dr. Emily Walcott Emmart in the September JOURNAL; a brief history of the Drug Code, by E. F. Kelly is given in the same issue.

Original hearing on the Code of Fair Competition for the retail trade was held August 25th, the National Retail Drug Trade Council was approved October 27, 1933, and the name changed to the National Retail Drug Code Authority; this body prepared a constitution and by-laws which was approved by the NRA. The National Code Authority liquidated, in 1935, with legal advice, by completing its records, by paying its bills and expenses. The records were placed in the keeping of the secretary for a period of one year when they will be turned over to the AMERICAN PHARMACEUTICAL ASSOCIATION for such historical use as can be made of them. Fair Trade subjects were among the important studies.

The Drug Institute of America voted to discontinue its activities on December 31st.

The following deaths were recorded after the annual meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION: P. E. Hommell, first dean of New Jersey College of Pharmacy; Henri Golaz, professor of Galenical Pharmacy, Lausanne; Dr. Herman Emde, director Pharmaceutical Chemical Institute, Albertus University; L. E. Highley, Hot Springs, So. Dak., pharmacist, serving 4th term as Mayor of his home city; Dr. Henry C. Biddle, pharmaceutical educator of California; Joseph F. Hindes, Baltimore manufacturer; Frederick H. Fricke, St. Louis pharmacist; J. Fred Windolph, New York pharmaceutical manufacturer; F. W. Meissner, outstanding Indiana pharmacist; L. L. Walton, Pennsylvania pharmacist and a former A. PH. A. president.

EDMUND NORRIS GATHERCOAL.

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. XXV JANUARY, 1936 No. 1

EDMUND NORRIS GATHERCOAL.

Edmund Norris Gathercoal was born near Sycamore, Illinois, in 1874. His father's people were English, his paternal grandfather having come to this country from southern England in 1857, while on his mother's side his ancestry is Pennsylvania Dutch.

Shortly after the boy completed his high school education his family moved to Chicago, where in 1891 young Gathercoal entered the drug store of T. W. Sollitt as an apprentice. Mr. Sollitt was a well-trained pharmacist and a graduate of the Chicago College of Pharmacy. Soon the boy became fired with ambition to qualify as his employer had done and in 1893 he entered upon his studies in the Chicago College of Pharmacy, now the College of Pharmacy of the University of Illinois. He was graduated at the head of his class in 1895. It is an indication of his later interest in pharmacognosy and botany that upon graduation he was awarded a microscope as a prize for his proficiency in these branches. Soon thereafter the young man entered Rush Medical College but after completing the sophomore year he was compelled by adverse circumstances to give up his medical course.

Within two years, however, the ambitious drug clerk established a business at Wilmette, a suburb of Chicago, where he conducted a prosperous pharmacy for eight years. He retained his interest in the College, which meanwhile had become the School of Pharmacy of the University of Illinois, and in 1907 he disposed of his successful drug business and accepted a full-time teaching position on the faculty of the School, where he has been successively advanced from instructor to full professorship in his favorite subject, pharmacognosy.

Professor Gathercoal has made frequent contributions to pharmaceutical literature, many of which have appeared in the JOURNAL. In 1915, he was awarded the Ebert Prize for his paper on "The Pharmacognosy of the Medicinal Rhamnus Barks." His reports of the meetings of the Chicago Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION extending over a period of fifteen years are models of brevity and clearness. He was assistant editor of the pharmacognosy section of *Botanical Abstracts* for several years and has served creditably on the Revision

Committee of the United States Pharmacopœia, both tenth and eleventh revisions, as a member of the Committee on Botany and Pharmacognosy. He has been chairman of the Committee of Revision of the National Formulary since 1929 and has done a splendid piece of work in the preparation of the N. F. VI. He has been president of the National Conference on Pharmaceutical Research since 1929. He was active in the formation of the International Color Council and its chairman for several years. He has served the AMERICAN PHARMACEUTICAL ASSOCIATION as vice-president and as a member of important committees. He is co-author of a well-known text in pharmacognosy and has written more than a hundred papers that have been published in pharmaceutical journals. In 1934, the Philadelphia College of Pharmacy conferred on him the honorary degree of Master in Pharmacy.

The distinguishing traits of the subject of this sketch are earnestness, industry and perseverance. With these he combines a broadness of view and a consideration for the feelings of others, which have made for him many warm friends. His well-founded religious convictions have aided him to face misfortune bravely and to take a sane view of life.

In 1899, Professor Gathercoal was married to Miss Cordelia M. Poole, and three children, Marion, Norris and Jean, have resulted from this union.—W. B. D.

SECTION N—MEDICAL SCIENCES, SUBSECTION N_2—PHARMACY OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

BY JOHN C. KRANTZ, JR., *Chairman.*

Section N_2 held a session on Monday afternoon December 30th, at which nine papers were presented by the respective authors and one was read by title. Also a joint session was held with Section N at which three papers were read.

Dr. George Reddish, of the St. Louis College of Pharmacy, discussed the potentialities and limitations of the phenol coefficient test. He stated that the test was applicable only to the study of the germicidal properties of compounds of a phenol-like nature, also, Dr. Reddish pointed out that many of the discrepancies that are reported by various workers with this test are due largely to deviations from the standard technique. The use of the test in evaluating antiseptic solutions was questioned.

Dr. John H. Gardner, of Washington University, discussed the chemistry of aloin. His researches indicated that there was possibly no anthracene nucleus in aloin and furthermore, that the definition of the United States Pharmacopœia defining this substance was not correct.

Dr. Noel E. Foss, of the School of Pharmacy of Duquesne University, prepared a large number of new unsymmetrical aryl sulphides. He reported on their structures, bacteriological activity and pharmacology. The thymol derivative was found to be the most germicidal.

From the School of Medicine of the University of Maryland, John C. Krantz, Jr., and his associates reported on the pharmacology of trichlorethylene and studies that were made with it as a useful therapeutic agent in the treatment of *angina pectoris*. The effect of the various chlorinated ethylenes on the blood vessels of the frog was studied also.

EDITORIAL

E. G. EBERLE, EDITOR 2215 Constitution Ave., WASHINGTON, D. C.

PHARMACY AND PUBLIC HEALTH.

THE completion of the U. S. Pharmacopœia and of the National Formulary draws attention to the importance of pharmacy in the work of revision and in improving the Materia Medica required by physicians and others who use these agents in their practice. Surgeon General Hugh S. Cumming closed an address at the Portland, Maine, meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION in 1928, by saying that "in the field of public health education and the support of and coöperation with the official health agencies, the pharmacists of this country have their opportunity and responsibility in contributing toward the efficacy of applied public health science."

Coming down the years are outstanding contributions by pharmacists that have aided the physicians in conquering disease, giving relief, and supplying the means for the prevention of disease. Every epidemic and the afflictions that handicap those who have recovered from acute attacks of disease awaken research workers to their duties and opportunities among whom are many pharmacists.

The approach of the President's birthday celebration brings to attention the disease which has baffled search for a cure without physical handicap. Infantile paralysis attacks not only the young but those more advanced in years and presents a problem yet unsolved; while this is true, more are giving study and more are hopeful that some one will find the means of relief. There is a source of satisfaction in the responses for help affording the means of treatment. This outstanding effort is growing and there are other institutions, notably the Crippled Childrens' Hospitals, which have brought relief to thousands of unfortunates.

During the past year meningitis has appeared as an epidemic and also other ailments that more frequently afflict; in all of these the pharmacist has a part, but usually as a citizen; however, whenever the call comes for service, he responds.

The service rendered by laboratories, as an example, "the Banting Foundation, quoting the *New York Times*, has been able to aid ninety-two projects in Canadian universities and to finance the work done at the University of Toronto on silicosis and vitamins." The *Times* comments: "If this (acceptance of endowments) is wicked the universities should be consistent and reject all endowments for medical research. For endowments come from profits—sometimes profits from the sale of patented drugs and medical apparatus."

Discovery of a new compound of insulin, protamine insulinate, has been heralded as most important in the treatment of diabetes—a disease claiming millions of victims.

The reports made in the press of the Association for the Advancement of Science meeting and of the studies presented before the AMERICAN PHARMACEUTICAL ASSOCIATION at the Portland meeting, some of which have been published in the JOURNAL, speak of the importance of pharmacy in public health. Writing somewhat along the same lines as these (June 1928) it was stated: The aim of the professions is to serve and pharmacy will adapt itself to the changing conditions, and "to serve well" marks the character of pharmacy; in that service a coöperation of all the activities is most essential. Pharmacy must change with therapeutic and, to some extent,

with surgical practice; the faculties of the pharmacy schools, therefore must, as never before, keep in touch with the advances and changes going on. Pharmacy has always supplied the knowledge concerning drugs and preparations required in medical and related practices and it will move on with the new orientation of therapeutics but mindful that desire and over-enthusiasm are sometimes a hindrance to progress. Correspondingly, in the education of the young pharmacist the older curriculum cannot be set aside; it is an essential part of the new, associated with the curriculum entailing knowledge and training which develop an understanding of the lines of evolution in the production of materia medica and of methods by which "their therapeutic value is detected and investigated, before they reach the stage of clinical application."*

CONFIDENCE, COÖRDINATION AND COÖPERATION ARE ESSENTIALS FOR SUCCESSFUL LEGISLATION.

INSTEAD of means for economic welfare there is too often a practice of economic warfare, resulting in lack of success and progress. Pharmacy is well organized, but groups and individuals are not always earnestly and sincerely intent on joining their efforts with others; as a result there is a division instead of coördinated cooperative efforts. There is a willingness to let others improve conditions, if they can or will, while others seek what they believe for their own interests. Realization seems to be developing, and should—that success depends on unison in action as far as this is reasonably possible and that confidence within the groups is essential, strengthened by a right understanding within related activities.

Legislation is necessary, but is not the sole essential—a proper understanding and due regard for the rights of all is quite as necessary; it is a stimulus and a corrective, promoting friendship and better service.

Laws should be the expressed demands of the people as a result of interest and study of existing conditions, which should be corrected for the general good; it is not promoted by the outstanding financial success of a few, especially if selfish motives predominate; it is necessary to look beyond the present and the limitations that obtain toward common interests. Citing an example with the latter thought—the proposed "Tydings Enabling Act" provides that nothing in the anti-trust laws "shall render illegal, contracts or agreements prescribing minimum prices for the resale at retail of a commodity which bears, or the label or container of which bears, the trade-mark, brand or the name of the producer or of the owner of such commodity and which is in fair and open competition with commodities of the same general class produced by others, when contracts or agreements of that description but not related to trade or commerce among the several States or with foreign nations are lawful under any statute now or hereafter in effect in any State, territory or the District of Columbia in which such resale at retail is to be made, and the making of such contracts or agreement shall not be an unfair method of competition under Section 5, as amended and supplemented."[1]

It is hoped that this measure, if enacted, will prove helpful in bettering business conduct and an advancement to a broader and more hopeful situation while laboring for the welfare of the people.

* Dr. H. H. Dale, before the Pharmaceutical Society of Great Britain, March 13, 1928.

[1] See August JOURNAL, page 731 and Editorials, pages 832–833.

SCIENTIFIC SECTION

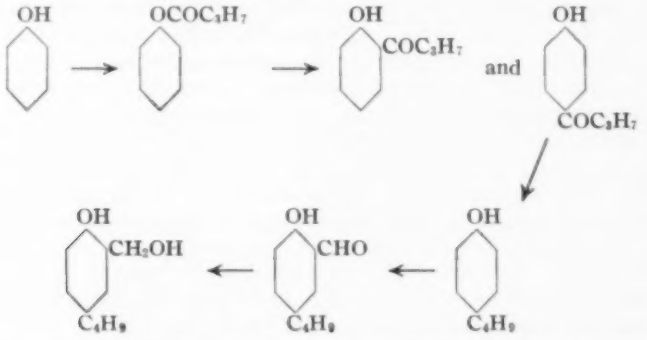
BOARD OF REVIEW OF PAPERS.—*Chairman*, F. E. Bibbins; Glenn L. Jenkins, John C. Krantz, Jr., Heber W. Youngken, L. W. Rowe, L. W. Rising, C. O. Lee, E. V. Lynn, W. G. Crockett, Frederick V. Lofgren.

THE PREPARATION OF *p*-BUTYL SALIGENIN.*[1]

BY ROBB V. RICE[2] AND WILTON C. HARDEN.

The preparation of this compound was undertaken in order to compare some of its physical and pharmacological properties with other substituted saligenins which have been prepared and studied. A comparison of these properties will be reported elsewhere.

The compounds prepared leading to the final formation of *p*-butyl saligenin are shown according to the following scheme:



The synthesis of *p*-butyl phenol necessary for the preparation of *p*-butyl saligenin was tried by three different methods. (*a*) The method of Fries was used for the rearrangement of phenyl-acyl esters to acyl phenols with the aid of aluminum chloride and subsequent reduction according to Sandulesco and Girard (1) with amalgamated zinc and hydrochloric acid. This procedure involved the formation of phenyl butyrate and its rearrangement to produce both *o*-butyryl phenol and *p*-butyryl phenol. The *p*-butyryl phenol was then reduced to give *p*-butyl phenol. (*b*) The method of Read and Mullin (2) was attempted according to which butyl benzene is nitrated, reduced to *o*- and *p*-amino-butyl benzenes, then the amino group replaced by a hydroxyl group by diazotization of the sulphate of the amine and slow elevation of the temperature. This method was discarded due to the fact that yields of butyl benzene obtained by the methods of Read and Foster (3), Radziszewski (4) and Balbino (5) were so low that further experimentation seemed impractical. (*c*) The method of Smith (6) was tried in which *n*-butylphenyl ether was rearranged by means of aluminum chloride and which gave approximately the same yields as method (*a*). Method (*a*) was preferred, however, since the mixture of *o*- and *p*-butyryl phenols obtained by rearrangement was easier to separate completely than a mixture of *o*- and *p*-butyl phenols.

* Scientific Section, A. PH. A., Portland, Ore., 1936.

[1] From the laboratories of Glenn L. Jenkins, Department of Pharmaceutical Chemistry, University of Maryland, School of Pharmacy.

[2] Dunning Fellow, University of Maryland, School of Pharmacy.

5-butyl-salicylaldehyde was made from *p*-butyl phenol by means of the Reimer-Tiemann reaction (7) for the production of aldehydes and this compound was reduced to *p*-butyl saligenin by the Adams platinum oxide catalyst reduction method (8).

EXPERIMENTAL.

Butyl Phenol.—295 Gm. of thionyl chloride was added slowly with shaking to 220 Gm. of butyric acid. A reflux condenser was then attached to the flask and the contents heated on a water-bath until gas evolution ceased; 235 Gm. of phenol was next added in small portions with shaking and the flask was again connected to the condenser and heated on an oil-bath at 130° for three hours or until no more hydrogen chloride was evolved. The resulting liquid was placed in a *beaker* surrounded with ice and allowed to cool, then 334 Gm. of anhydrous aluminum chloride slowly stirred in. This resulted in an amber-colored viscous mixture which quickly thinned and produced large amounts of hydrogen chloride on warming. Heating was continued at 130° until no more gas was given off, leaving an almost solid red-brown mass which was poured onto a flat plate while hot. On cooling a brittle solid resulted which was powdered and dropped into cold dilute hydrochloric acid with stirring. The dark viscous liquid which separated was diluted with benzene, separated from the acid and dried with anhydrous sodium sulphate. After distilling off the benzene, vacuum distillation of the remaining oil gave three main fractions: (*a*) a low-boiling fraction of undetermined composition; (*b*) a fraction distilling at 100–110° at 8-mm. pressure (*o*-butyryl phenol); (*c*) a fraction distilling at 165–180° at 8 mm. which solidifies immediately on cooling (*p*-butyryl phenol). An average of 100 Gm. each of Fractions *b* and *c* was obtained in several trials of this method. The *p*-butyryl phenol was purified by recrystallizing from ligroin containing 5 per cent benzene until the melting point was constant at 91° (9).

To reduce this substance 50 Gm. was placed in a three-necked flask provided with a mechanical stirrer and reflux condenser, the flask containing 250 Gm. of amalgamated zinc and 250 cc. of concentrated hydrochloric acid. The contents were boiled and stirred very vigorously over a period of twenty hours, more acid being added from time to time. The *p*-butyl phenol produced was diluted with benzene, dried with anhydrous sodium sulphate and distilled in vacuum. It distils at 119° at 10-mm. pressure. A yield of 70–76 per cent was obtained by this reduction. The product melts at 22° and boils at 248°, which is in agreement with data reported by other workers (1). It produces a phenyl urethane melting at 113°. Analysis: Nitrogen found—5.20 per cent; calculated—5.20 per cent.

5-Butyl-Salicylaldehyde.—In a three-necked flask provided with a mechanical stirrer, reflux condenser and thermometer 120 Gm. of chloroform was added to a mixture of 50 Gm. of *p*-butyl phenol and 160 Gm. of sodium hydroxide in 160 cc. of water over a period of three hours. The reaction was carried out at 65–70° by heating in a water-bath. The addition of enough water during the reaction to aid in better stirring did not affect the yield of product. It was necessary to stop the addition of chloroform frequently to prevent the mixture from frothing over. Stirring and heating were continued for an hour after all chloroform had been added. The mixture was then subjected to steam distillation to remove excess chloroform and finally acidified carefully with dilute sulphuric acid and again subjected to steam distillation until no more aldehyde was obtained. The average yield was 10 Gm.

The resulting aldehyde which distilled as a pale yellow, thick liquid was purified by making the sodium sulphite addition product which can be recrystallized from alcohol.

Reduction of 5-Butyl-salicylaldehyde.—About 300 cc. of alcohol and 0.2 Gm. of Adams platinum oxide catalyst were added to 10 Gm. of aldehyde. The container was then attached to a mechanical shaker and placed under a pressure of ten pounds of hydrogen. Shaking was continued until no further reduction took place. Yields of from 80–90 per cent were obtained by this method.

After reduction the alcoholic solution was made faintly alkaline to litmus with ammonia to prevent polymerization and the alcohol evaporated on a water-bath. The *p*-butyl saligenin thus obtained may be recrystallized from carbon tetrachloride. It crystallizes as white plate-like crystals, soapy to the touch. M. p. 81°. The compound is practically insoluble in water but readily soluble in alcohol, carbon tetrachloride, benzene, chloroform and acetone.

The author wishes to thank Dr. Fitzgerald Dunning, of Hynson, Westcott and Dunning, Inc., for the use of their laboratories and material while carrying out this investigation.

SUMMARY.

p-Butyl saligenin has been prepared from *p*-butyl phenol by the formation of 5-butyl salicylaldehyde and its subsequent reduction with hydrogen.

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BISMUTH-SODIUM-POTASSIUM TARTRATE SOLUTIONS.*

BY A. H. CLARK.[1]

Considerable interest has been taken during recent years in the so-called complex bismuth tartrates. The soluble salts have been used extensively in the treatment of syphilis in place of arsenic compounds, and solutions have been used for local applications. This communication deals with the preparation of a neutral solution containing bismuth in combination with tartrate and glycerin.

After many experiments or trials it has been established that such solutions are readily obtained by the procedure outlined:

Bismuth hydroxide is first prepared as free as possible from bismuth salts by dissolving bismuth subnitrate or subcarbonate in water and nitric acid. This solution is then precipitated with ammonia water and washed by decantation and collected by aid of a Büchner filter and moisture removed as completely as possible by suction.

The moist precipitate is then added to glycerin and a solution of Rochelle salt. To this mixture is then added sodium or potassium hydroxide until solution takes place.

To the strongly alkaline solution thus obtained is added tartaric acid until the mixture is neutral to litmus paper.

By this procedure a solution is obtained that is neutral or faintly acid to litmus or phenolphthalein and shows slight alkalinity to methyl orange. It will also contain a small amount of nitrate. Just what is the state of combination between the tartrate, bismuth and glycerin it is impossible to state as the writer has prepared a large number of solutions in which the proportions of the three vary widely. It is possible to vary the proportions of bismuth, glycerin, alkali and tartrate within wide limits. Indeed it is possible to prepare solutions from bismuth hydroxide, glyerin and alkali alone but such solutions are strongly alkaline in reaction. By starting with a stated amount of bismuth salt yielding a known per cent of Bi_2O_3 upon ignition, a solution containing a desired per cent of Bi_2O_3 may be

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* Scientific Section, A. PH. A., Portland meeting, 1935.

[1] University of Illinois, College of Pharmacy, Chicago.

readily obtained. A typical procedure is as follows, the quantities given yielding a solution containing about 12 Gm. Bi_2O_3 in 100 cc.:

Bismuth Subcarbonate	15 Gm.
Water	25 cc.
Conc. nitric acid	25 cc.

Heat, but do not boil, until solution is complete and all carbon dioxide is expelled. Dilute to about 600 cc. but not to the precipitation point. Add ammonia water in slight excess. Use litmus paper and have the mixture alkaline throughout. Collect the precipitate on a Büchner filter by suction, washing well to remove soluble salts.

Dissolve 10 Gm. Rochelle salt in water to make about 25 cc. When the Rochelle salt is dissolved add 20 cc. of glycerin and heat to about 100° C. Do not boil.

To the hot mixture add the bismuth precipitate and mix well. To this mixture add a 50% solution of sodium hydroxide, a few drops at a time, stirring continuously until solution is complete; to this solution add a pasty mixture of tartaric acid and water, a little at a time, until it just turns blue litmus red. No precipitation should occur at this point, but if it does—a drop or two of ammonia will usually clear up the precipitate. Add water to bring the volume up to 100 cc.

The above has been varied by increasing or decreasing the glycerin, substituting sodium tartrate or potassium tartrate for the Rochelle salt, potassium hydroxide for the sodium hydroxide, etc. It has been found that within a quite liberal range all these factors may be varied and solutions obtained that seem to be permanent.

Experiments are under way to determine whether or not a solid bismuth compound that is permanent and soluble in water can be separated from such solutions.

DRUG EXTRACTION. VI. DETERMINATION OF THE PRESSURE EXERTED BY A DRUG DURING PERCOLATION.*,[1]

BY WILLIAM J. HUSA[2] AND LOUIS MAGID.

Previous experiments (1) seem to indicate that maximum swelling of powdered drugs is not attained with the proportions of liquid ordinarily used in moistening drug powders preparatory to packing in a percolator. From this it would follow that a certain amount of pressure would be developed in the percolator after the drug has been packed and excess menstruum added. This pressure might affect the imbibition of the menstruum, the solvent power of the menstruum, or result in a slowing or even complete stopping of the process of percolation. Because of the fundamental importance of this question, an apparatus and a method have been developed for the determination of the pressure exerted by a drug during percolation. Using this new apparatus, measurements have been made on powdered belladonna root, rhubarb, senna and red cinchona.

APPARATUS FOR DETERMINATION OF PRESSURE.

An apparatus (Fig. 1) has been developed, whereby the pressure exerted by a powdered drug during percolation can be measured. A rubber tube, closed at one end and connected to

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* Scientific Section, A. PH. A., Portland meeting, 1935.

[1] This investigation was aided by a grant from the AMERICAN PHARMACEUTICAL ASSOCIATION Research Fund.

[2] Head Professor of Pharmacy, University of Florida.

a glass tube at the other end, is placed in a percolator in such a manner that the powdered drug may be packed entirely around it. The rubber tube is filled with water as is also the connecting glass tube down to a point exactly opposite the bottom of the rubber tube. Mercury then fills the remainder of the glass tube, bent in the form of a U, until the mercury in the two arms is at the same level. The powdered drug is packed firmly around the rubber tube, using moderate pressure, and taking care not to displace the levels of the mercury arms. As the percolation proceeds, the volume of the rubber tube is kept constant by maintaining the level of the left mercury arm. As more menstruum is added, any pressure caused by further swelling of the drug tends to force the mercury in the left arm downward, but this force is neutralized by the addition of mercury to the right arm by means of an extension filled with mercury and connected to the bottom of the U-tube. By measuring the height of mercury in the right arm from the point designated as zero, the increase or decrease in pressure exerted by the drug can be determined. The volume of the drug in the percolator is kept constant by means of a perforated brass plate, which is placed on the surface of the powdered drug and kept in place by means of rods clamped in a fixed position.

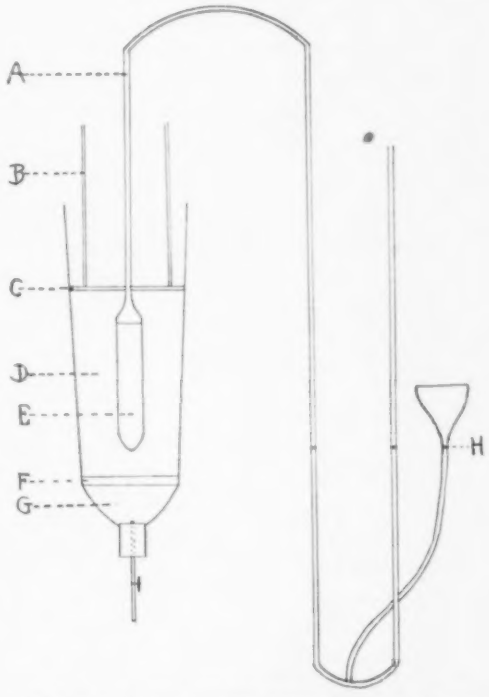

Fig. 1.—Apparatus for determination of pressure in percolator. A—Glass Tube; B—Iron Rod; C—Perforated Brass Plate; D—Drug; E—Rubber Tube; F—Sand; G—Cotton; H—Level of Mercury.

The authors are indebted to Dr. R. C. Williamson, Head of the Department of Physics, for helpful suggestions in connection with the development of the apparatus.

EXPERIMENTAL DATA.

Pressure in Percolator, Rate of Free Flow and Percentage Swelling of Powdered Belladonna Root Moistened with Varying Proportions of Water.—Four 100-Gm. portions of powdered belladonna root (moisture content of 9.60%) were moistened with 0, 25, 50 and 100 cc., respectively, of water. No time was allowed for maceration of the moistened powders, each portion being packed in a percolator fitted with the apparatus for determination of pressure, and percolation started within fifteen minutes after moistening, using water as the menstruum.

The percolators used being graduated, it was possible to ascertain the volume of the packed drugs by correcting the apparent volume for the volume occupied by the apparatus for pressure determination. Data were thus obtained as to the swelling of belladonna root in No. 40 powder when moistened with varying quantities of water.

TABLE I.—SWELLING OF BELLADONNA ROOT IN NO. 40 POWDER WITH VARIOUS AMOUNTS OF MOISTENING LIQUID.

Cc. of Water Used for Moistening.	Volume of Powder.	Percentage Swelling.
Dry	188 cc.	..
25 cc.	211 cc.	12
50 cc.	225 cc.	20
100 cc.	245 cc.	30

The results in Table I indicate that the percentage swelling increases as the proportion of moistening liquid is increased.

The lower orifice of the percolator was left open so that the volume of percolate collected after various time intervals gives a measure of the rate of free flow. In Table II, data are given as to the rate of flow and pressure exerted in the four percolators.

TABLE II.—PRESSURE DEVELOPED AND RATE OF FREE FLOW FOR BELLADONNA ROOT MOISTENED WITH VARYING QUANTITIES OF LIQUID, USING WATER AS THE MENSTRUUM.

Time in Hours.	Pressure in Mm. of Mercury.				Number of Cc. of Percolate Collected.			
	0.*	25.*	50.*	100.*	0.*	25.*	50.*	100.*
1	64	9	13	10	0	0	0	25
7	69	19	26	19	0	0	15	205
10	69	30	29	17	0	10	40	300
14	69	34	34	15	0	31	92	425
24	69	42	31	11	0	84	200	665
38	99	60	29	7	5	151	328	765
48	108	59	29	6	18	167	360	796
72	123	46	21	4	34	192	420	813
96	119	39	..	1	49	219	...	835
120	83	35	..	..	53	239	...	...
144	77	29	..	..	57	254	...	...

* Number of cc. of moistening liquid used for 100 Gm. of drug.

The results in Table II indicate that as the proportion of water used for moistening increases, the pressure exerted decreases. In each percolator the pressure rises to a maximum and then decreases. The rate of free flow increases rapidly with increasing amounts of moistening liquid. The menstruum had penetrated completely down through the column of packed drug after 26 hours when the powder was packed dry, after 7 hours when the powder was moistened with 25 cc. of water before packing, after 3 hours when 50 cc. of moistening liquid was used and in 25 minutes when 100 cc. of moistening liquid was used.

The decrease in pressure during the later stages of percolation is probably due to the extraction of soluble constituents, thus decreasing the quantity of solid material present. In the case of belladonna root, the decrease in pressure does not bring about an increased rate of flow, but conversely there is a decreased rate of free flow in the later stages, which occurs later than the decrease in pressure. Apparently some factor comes into play to reduce the rate of flow; possibly this is due to swelling of starch grains or other material in such a manner as to decrease the permeability of the cells, the swelling perhaps taking place in such a way as to fill the open spaces in the drug without increasing the total volume (and pressure).

Pressure in Percolator, Rate of Free Flow and Percentage Swelling of Drugs in Hydro-Alcoholic Menstrua.—Data from experiments on various drugs and menstrua are given in Table III.

Time Factor in Imbibition.—An experiment was performed, using the centrifuge method, to determine the amount of imbibition of water by belladonna root in No. 40 powder with 10 minutes, 24 hours and 48 hours of maceration. The pur-

pose of the experiment was to discover whether appreciable additional imbibition took place between 24 and 48 hours, since data on this point had not previously been obtained. The results of the experiments are given in Table IV.

TABLE III.—A. DETERMINATION OF PRESSURE IN PERCOLATOR AND RATE OF FREE FLOW USING 100-GM. PORTIONS OF BELLADONNA ROOT IN NO. 40 POWDER.

Menstruum.	Cc. of Moistening Liquid.	% Swelling.	Hours Maceration. Before Packing.	Hours Maceration. After Packing.	Hours for Flow to Commence.	Time of Readings in Hours after Flow Started.	Cc. Percolate.	Pressure in Mm. Mercury.
Water	50	36	6	0	2.08	0.50	15	+ 2
						2.33	190	+ 2
						12.33	480	− 4
						17.75	780	− 8
						21.66	1000	− 9
						0.00	0	+13
Water	50	36	6	48	2.25	4.33	50	+17
						15.41	140	+14
						52.00	300	+ 8
						72.75	330	− 2
Alc. 5 vol.—water 1 vol.	0	..	0	0	1.50	1.58	30	+ 7
						2.75	50	+ 1
						5.58	140	0
						16.83	450	+18
						30.83	950	+15
						46.00	1430	+12
Alc. 5 vol.—water 1 vol.	25	24	0	0	0.41	0.25	30	− 2
						1.92	330	− 4
						4.00	700	0
						4.58	800	+ 2
						5.58	1000	+ 5
Alc. 5 vol.—water 1 vol.	50	24	0	0	0.16	0.25	50	− 2
						1.41	350	− 3
						1.75	480	− 3
						2.75	780	− 2
						3.50	1000	− 2
Alc. 5 vol.—water 1 vol.	50	27	6	0	0.16	0.33	90	− 9
						1.08	350	−10
						1.41	500	−11
						2.33	900	−11
						2.50	1000	−11
Alc. 5 vol.—water 1 vol.	50	24	6	48	0.16	0.08	28	+ 1
						0.25	87	0
						1.25	480	0
						2.83	1000	− 1
Alcohol	0	..	0	0	0.66	0.25	10	+ 5
						3.66	120	+ 7
						15.58	470	+14
						20.08	600	+18
						40.08	1100	+20
Alcohol	50	21	0	0	0.08	0.20	90	− 5
						0.45	240	− 6
						0.86	420	− 5
						1.11	1000	− 6
B. Using 100 Gm. Rhubarb in No. 40 Powder.								
Alc. 4 vol.—water 1 vol.	50	16	6	48	0.10	0.13	30	+ 1
						0.33	290	0
						0.68	780	− 2
						0.83	1000	− 2
C. Using 100 Gm. Red Cinchona in No. 40 Powder.								
U. S. P. X Menstruum I and II	50	38	6	48	0.20	0.08	28	+19
						0.16	100	+15
						0.35	300	+ 9
						0.86	880	+ 6
						1.00	1000	+ 5

	D.	Using 100 Gm. Alexandria Senna in No. 20 Powder.						
Alc. 1 vol.—water 2 vol.	50	18	6	48	0.10	0.05	30	+ 1
						0.10	50	0
						0.18	100	− 2
						0.66	400	−10
						1.68	1000	−18

TABLE IV.—WEIGHT IN GM. OF WATER IMBIBED BY BELLADONNA ROOT IN NO. 40 POWDER.

For 5 Gm. of Drug (by Experiment), Time of Maceration.			For 100 Gm. of Drug (Calculated), Time of Maceration.		
10 Min.	24 Hrs.	48 Hrs.	10 Min.	24 Hrs.	48 Hrs.
11.74	13.70	14.42	234.8	274.0	288.4
12.02	13.60	14.24	240.4	272.0	284.8
(Av.) 11.88	13.65	14.33	237.6	273.0	286.6

The results indicate that imbibition increases somewhat with time.

DISCUSSION OF RESULTS.

Percolation of Belladonna Root with Water.—Moistening of 100 Gm. of powdered belladonna root with 50 cc. of water resulted in 20% swelling if no maceration were allowed and 36% if 6 hours' maceration before packing was employed. The swelling results account for the fact that the rate of free flow was greater and the pressure less in the latter case. When 48 hours' maceration after packing is used, the rate of free flow is smaller than when no maceration after packing is allowed. Using 6 hours' maceration before packing and 48 hours' maceration after packing, the pressure in the percolator is greater than when only six hours' maceration before packing is employed but less than when no maceration whatever is used.

Percolation of Powdered Belladonna Root with Hydro-Alcoholic Menstruum.—Using a menstruum of alcohol 5 vol.—water 1 vol., data were obtained on the effects of using varying proportions for moistening, and the effects of the 6-hour period of maceration before packing and the 48-hour period after packing. Allowing no time for maceration, increased amounts of moistening liquid increase the rate of free flow and decrease the pressure. Maceration for 6 hours before packing increased the rate of free flow and decreased the pressure; the pressure in the percolator was increased by maceration for 48 hours after packing. Using a menstruum of alcohol, the rate of free flow is likewise increased and the pressure decreased by use of 50 cc. of moistening liquid for 100 Gm. of drug.

Percolation of Other Drugs.—Using the official menstrua and the official processes for the preparation of the respective fluidextracts, percolation experiments were carried out using rhubarb, red cinchona and Alexandria senna. In each case the rates of free flow were very rapid and the pressures exerted decreased during the percolation. The greatest pressure was observed during the percolation of red cinchona, while the greatest decrease in pressure during percolation was observed with senna. The rates of free flow increased during the percolation, showing that as soluble constituents were removed, a more rapid passage of the menstrua was allowed.

SUMMARY.

An apparatus has been developed for determining the pressure exerted by a drug during percolation. Using this new apparatus, measurements have been made on belladonna root, rhubarb, senna and red cinchona.

In case of belladonna root the rate of free flow decreases after a time, even though the pressure in the percolator decreases; with the other drugs there is a decreased pressure accompanied by an increased rate of flow as percolation proceeds. In general, the use of increasing quantities of moistening liquid decreases the pressure and increases the rate of free flow. Maceration after packing increases the pressure in the percolator. The greatest pressure was observed during the percolation of red cinchona, while the greatest decrease in pressure during percolation was observed with senna.

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A STUDY OF *LACINARIA* SPECIES.*

BY B. V. CHRISTENSEN[1] AND G. M. HOCKING.

Lacinaria or *Laciniaria*[2] is the name generally used to-day by taxonomists for the genus formerly known as *Liatris*, although this latter name still persists on continental Europe. Under the name "Liatris," the corm of several species of the genus has been used in American medical practice for over a century, particularly by the Eclectics and Shakers.

In the present work, attention was confined chiefly to the species *L. spicata* (L.) Kuntze and *L. tenuifolia* (Nuttall) Kuntze, which grow commonly in the region of Gainesville, Florida. The former species was particularly valuable for study because it is the subterranean parts of this member of the genus which have been used most frequently as a drug.

LACINARIA SPICATA.

Lacinaria spicata has been known by at least thirty-five common English names, of which the most important are (Blue) Blazing Star, (Ohio) Devil's Bite, Rattlesnake's Master, (Spike) Gayfeather, and (Spiked) Button Snakeroot. Some of these names indicate medicinal uses of the plant, and even the scientific name, *Liatris*, is said by some to be derived from a Greek word meaning "invulnerable," referring perhaps to its supposed value in treating (snake) wounds. The species differs from all but two or three others of the same genus in preferring a thinly wooded *moist* humid soil. It is said to grow throughout eastern North America in the area bounded by the Atlantic Ocean on the east, the Gulf of Mexico in the south, Arizona and Colorado in the west, and Minnesota and Ontario on the north. It is perhaps the most widely distributed *Lacinaria* species.

The underground portions used constitute the corm with attached fibrous roots. The corm is irregularly globoid, tapering to the stem above, often laterally lobed, and measuring 1.5 to 2.5 cm. in vertical diameter and 1.5 to 3 cm. in horizontal diameter. Externally, it is pale reddish brown to brownish gray, with roughly furrowed surface; the upper portion covered with adherent fibrous leaf bases, the lower bearing numerous small fibrous roots which originate largely at the tips of the corm protrusions. Fracture tough, woody, showing dirty yellowish internally; when cut, showing waxy sheen. In younger specimens one or two, in older several, woody rings

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* Scientific Section, A. PH. A., Portland meeting, 1935.

[1] Director, School of Pharmacy, University of Florida, Gainesville, Florida.

[2] The authors consider *Laciniaria* to be somewhat less preferable by reason that the same name is given to a molluscan genus.

noted as distinct striations. The corm is protected externally with several layers of cork cells, while the great bulk of the organ consists of parenchyma tissue. Scattered sporadically through the cork and constituting a secondary cortex to protect the vascular bundles outside of which they lie are strands of sclerenchyma. Sclerenchymatic strands also extend radially through the phloem and xylem.

Odor strongly terebinthinate, aromatic, somewhat resembling that of elecampane. Taste strongly terebinthinate, acrid, unpleasant, burning.

The roots are small and fibrous; in cross section, the cortex is approximately equal in thickness to the wood from which it is easily separable.

LACINARIA TENUIFOLIA.

This species has been referred to in English by at least thirteen common names, of which the most characteristic is probably Slender-Leaved Blazing Star, or simply Blazing Star. In the region of Gainesville, it appears to have the common name of "Deer Bowl."

The plant has a more restricted geographical distribution than *L. spicata*, being found from North Carolina to southern Florida and west into Alabama.

The corm is sub-globose, in older specimens tending to become irregular in form; varying from 1.2 to 2 cm. in vertical diameter, and from 1.5 to 3 cm. in horizontal diameter. Externally, dark grayish brown, with smooth surface; upper portion showing traces of stem or stems; lower portion bearing root scars and fibrous roots, much less abundant than in *L. spicata*. Fracture of corm woody; internally, pale yellowish to faint brownish white. Otherwise similar to *L. spicata*.

Odor characteristic, aromatic, somewhat terebinthinate; taste rather sweetish and pungent.

CHEMISTRY.

General analysis by the Dragendorff scheme gave the following results in percentages of the bone-dry weight:

	L. spicata.		*L. tenuifolia.*		
Moisture (corrected for vol. matter)	7.79		7.61		
Ash, total		5.32		7.74	
acid-insoluble		....		4.38	
Petroleum ether extract, total	4.18	(hot)	4.58	(cold)	
non-volatile		4.12		...	
volatile		0.06		...	
Ethyl ether[1] extract, total	3.46	(hot)	9.81	(hot)	
non-volatile		2.91		7.86	
volatile		0.55		1.95	
Ethyl alcohol extract	2.08	(abs.)	6.81	(92%)	
			14.69	(70%)	
Distilled water and NaOH solution extract	67.74		56.02		
Total extractive and moisture	85.25		84.83		
Crude fibre, etc.	14.75		15.17		
	100.00		100.00		

[1] Used ordinary ether (97%).

The specific constituents found included the following:[1] volatile oil, 0.02% (0.06% in

[1] Qualitatively, the two species were found very similar; unless otherwise noted, the percentages refer to *L. tenuifolia*.

L. spicata); fixed oil, 4.56%; unsaponifiable matter, 0.02%; resin acids, 3.59%; resenes, etc., 4.29%; tannin; a sterol; caoutchouc-like substance; phlobaphene; bitter principle; reducing sugars, including ketohexoses; inulin; phytomelane; suberin; lignin; cellulose; mineral matter.

The sclerenchyma cells of the rhizome and also of the pericarps of both species and also of *L. pauciflora* (Pursh) Kuntze were embedded in phytomelane. This material has been found in the flower head of *L. scariosa* by Hanausek (1), and it has been discovered in the flower heads of many other *Compositæ*, but this is apparently one of the few times in which it has been reported from the underground parts.

The sterol resembled that one found by Rümpler (2) in the beet and named by him "Betasterin." This sterol had a melting point of 116°, was practically insoluble in cold water, and boiling water dissolved only one part in 1750 of solvent. It was only slightly soluble in 92% alcohol, petroleum ether (1:700); somewhat more soluble in cold absolute alcohol (1:200) and chloroform (1:90), and most soluble in ether (1:24). The sterol occurred in the form of rhombic or acicular crystals. With ferric chloride solution, strong hydrochloric acid, and chloroform, a dark blue coloration was produced. When treated with diluted sulphuric acid (1:5 of water), a greenish coloration was produced, and on the addition of iodine solution, several successive coloration reactions occurred through yellow and red to red-brown.

Coumarin has frequently been reported from the dried leaves of *L. spicata* (3), (4) and related species; while Sanford (5) found that the inflorescence rather than the leaves gave out the greater fragrance. In the present work, dried plants were placed in a chamber saturated with ether vapor. After a time, the plants of both species had the distinct hay odor characteristic of coumarin.

USES.

Members of genus *Lacinaria* have been used as foods (*L. punctata* Hook by the Tewa Indians (6)), for ornamentation, in perfumery and as insect repellant (*L. spicata*), as medical agents, and as adulterants for other crude drugs.

As a drug adulterant, the subterranean parts of *Lacinaria* species have been used to adulterate Helonias (7), and possibly to substitute for *Glycine apios* L. (*Apios tuberosa* Moench), known as Indian Potato (8). *L. spicata*, in particular, has been used as a substitute for *Eryngium aquaticum* L. (Water Eryngo Root), while various species of *Lacinaria* have been substituted for the more desirable *L. spicata* (8).

A great deal has been written in regard to the medicinal value and uses of "Liatris." In the past, it has been referred to as alexiteric (especially in rattlesnake bite), diuretic, astringent, tonic, stimulant, alterative, diaphoretic,[1] febrifuge, antispasmodic, anodyne, emmenagogue, expectorant, carminative and antisyphilitic. It has been recommended for use in a great many conditions and diseases; in general, it has been looked upon as most valuable in genito-urinary disorders, in addition to its systemic uses.

To determine as clearly as possible the effects of the drug, preparations of *Lacinari tenuifolia* were administered first to a guinea pig, in relatively enormous doses, and later to a healthy human subject, in more moderate amounts.

The soft extract prepared by evaporation of the fluidextract was administered orally to a guinea pig weighing 450 Gm. in a dose equivalent to 7.14 Gm. of the crude drug. This represented the equivalent of over 110 Gm. of the crude drug to

[1] Cf. "Diaphoretic or Sweating Powder," patent awarded H. Howard in 1832 (9).

a man weighing 150 pounds. By checking urinary output, this was found to remain practically unaffected, although there was a considerable purgative action. After the lapse of some time, an amount of the sterol equivalent to 62.4 Gm. (of sterol) for a 150-pound organism was administered orally to the same animal: no effects were noted.

Three experiments were carried on with the human subject; in the first, 28.4 Gm. of the drug, in the form of extract and fluidextract, was administered. In the second test, 6 cc. of the fluidextract, representing the average dose, was administered. In the final test, approximately 10 Gm. of the crude drug in the form of decoction was given.

The effects noted include a local stimulation of the mucous surfaces of the mouth and throat, nausea and revulsion from the extreme bitterness, and slight expectorant action. Following absorption, the effects were a pronounced general stimulant and tonic action which manifested itself in insomnia, increased activity, rise in temperature and diaphoresis (the latter two not pronounced, however), and, of particular interest, a reduction in heart rate, with the missing of beats. Even a therapeutic dose reduced the pulse from 67 to 53 beats per minute in the course of four hours, while the largest dose given lowered it to 48 beats. Contrary to the common opinion, and even to the experimental results of Neal (10), *L. tenuifolia* was not found to have a distinct diuretic effect.

SUMMARY.

A pharmacognostic examination of the corm and roots of the species *Lacinaria spicta* (L.) Kuntze and *L. tenuifolia* (Nutt.) Kuntze has been made. A preliminary chemical examination disclosed the presence of volatile oil, fixed oil, resins, tannin, a sterol similar to Betasterin, and bitter principle, among other constituents. Phytomelane was found in both the rhizome and pericarp of the two species and also of *L. pauciflora* (Pursh) Kuntze.

The drug gives evidence of value as a tonic, stimulant and cardiac drug; but in the doses in which used, it probably is of little value as diuretic or diaphoretic, properties which have generally been ascribed to it.

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The University of Texas, in coöperation with the Commission of Control for Texas Centennial Celebrations, is planning a University Centennial Exposition on the campus at Austin from June 1st to November 30th, of this year.

THE ASSAY OF HYPOPHOSPHITES OFFICIAL IN THE NATIONAL FORMULARY.*[1]

BY GLENN L. JENKINS[1] AND CHARLES F. BRUENING.[2]

The ammonium, calcium, iron, manganese, potassium and sodium hypophosphites are official in the National Formulary. The official methods of assay (1) for these salts are based, except in the case of iron hypophosphite, on the argentometric determination of the phosphate formed by the oxidation of the hypophosphite.

The official methods of assays for five of the hypophosphites, in addition to being indirect, are subject to other criticisms regarding accuracy (2), (3).

The results of a prescription survey (4) indicate that the official hypophosphite salts, as well as syrups containing hypophosphites, are extensively prescribed. It is desirable, therefore, because of their wide use and objections to the present official methods, to develop improved methods for the assay of these salts.

METHODS OF ASSAY.

Numerous methods have been proposed for the determination of hypophosphites. These methods may be divided into two main classes, namely: (*a*) Methods based on the determination of the phosphate formed by oxidation of the hypophosphite by acidimetric means or by variations of the molybdate method. These methods have been studied by Viebock and Fuchs (5), Mengdehl (6), Raunich (7), Fiest (8), Ferrey (9), Bond (3) and Barnard and McAbee (10). (*b*) Methods involving the oxidation of hypophosphite to phosphate and the subsequent determination of the quantity of oxidizing agent consumed in the reaction.

The work of Raquet and Pinte (11), Gall and Ditt (12), Hovorker (13), Wolf and Jung (14), Ionesco-Matiu and A. Popesco (15), Kolthoff (16), Bayer (17), Kosezegi (18), Boyce and Bauzil (19), Dickerson and Snyder (2), Ziry (20), National Formulary Bulletin (21), Brukl and Behr (22), Marchott and Steinhauser (23), Rupp and Kroll (24), Harrison (25), Marino and Pellegrini (26) and Cocking and Kettle (27) has showed that these methods of the second class are quite satisfactory. The oxidizing agents used in the above methods include potassium permanganate in alkaline and acid solution, potassium manganate, bromine, iodine, potassium iodate, iodic acid, potassium dichromate and mercuric chloride. The methods in this group appear to be satisfactory and several (21), (23), (24) have been selected for critical study.

EXPERIMENTAL PART.

The samples of the salts used were manufactured by a well-known and reputable chemical company. The sodium hypophosphite used was of the chemically pure (C.P.) grade, the only salt obtainable on the market in this grade. The other five salts were of the National Formulary (NF) grade. All the salts conformed strictly to the tests for purity of the National Formulary. The salts were dried over H_2SO_4 as directed in the National Formulary and these dried salts were used throughout this investigation.

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* Scientific Section, A. PH. A., Portland meeting, 1935.

[1] From the Department of Pharmaceutical Chemistry, University of Maryland, School of Pharmacy.

[2] Abstracted from a thesis submitted to the Graduate School of the University of Maryland by Charles F. Bruening in partial fulfilment of the requirements for the degree of Master of Science.

NATIONAL FORMULARY METHODS.

All of the salts were assayed by the official methods (1) for the purpose of comparison with other methods and to see whether any justification exists for criticism to the methods (2), (3). The official methods of assay of five of the salts are essentially the same, differing from each other only in minor details. With the ammonium and manganese salts the positive ions are removed before proceeding with the assay, the ammonium ion being removed as ammonia from an alkaline solution and the manganese ion by precipitation as MnO_2 by means of hydrogen peroxide in an alkaline solution.

With the exceptions noted the basic method for five of the salts is: The hypophosphite salt is dissolved in water and oxidized by the addition of nitric acid, the solution being evaporated to dryness on the water-bath. More concentrated nitric acid is added and the evaporation repeated to obtain complete oxidation. After dissolving the residue in water and making alkaline to phenolphthalein, the phosphate is precipitated in an aliquot by the addition of an excess of $N/10$ $AgNO_3$; zinc oxide being used to keep the solution neutral. The reaction is represented by the equation $3AgNO_3 + Na_2HPO_4 \longrightarrow Ag_3PO_4 + HNO_3 + 2NaNO_3$. After making up to volume and filtering, an aliquot is titrated with $N/10$ NH_4CNS using ferric alum as indicator. To make the National Formulary methods more precise, one modification was adopted, namely, the oxidized residue was dissolved in distilled water and made up to a volume of 200 cc. instead of 100 cc. as specified, and aliquots of 20 cc. used in place of 10 cc. for the precipitation of the phosphate with standard silver nitrate. The results obtained are shown in Table I.

TABLE I.

Hypophosphite salt.	Weight of Sample Gm.	Amount Found Gm.	Yield Per Cent.	National Formulary Minimum Requirement Per Cent.
Sodium + H_2O	1.0008	0.9999	99.91	98
	1.0007	1.0013	100.06	
	1.0007	1.0020	100.13	
Potassium	0.9980	0.9687	97.06	98
	0.9982	0.9673	96.90	
	0.9985	0.9659	96.73	
Ammonium	1.0014	0.9606	95.93	98
	1.0013	0.9598	95.86	
	1.0008	0.9584	95.77	
Calcium	0.7503	0.7226	96.31	98
	0.7513	0.7266	96.71	
Manganese + H_2O	1.0009	0.8947	89.39	97
	1.0009	0.9103	90.95	
	1.0009	0.9029	90.21	
	1.0028	1.0007	99.79	98
Ferric	1.0031	1.0025	99.94	
	1.0008	0.9995	99.87	

The results for the iron salt have been included in this table although the official method of assay depends on a different process than that for the other salts. This method of assay determines the iron content by the usual iodometric method, after oxidation of the hypophosphite to phosphate, and results are expressed as ferric hypophosphite.

The results obtained for the first five salts, indicate that the official methods apparently give low results since only the sodium salt conforms to the minimum requirement of the National Formulary. The results for the manganese salt are very low although similar results were obtained using different samples of the salt.

NATIONAL FORMULARY METHODS, MODIFIED.

Silver phosphate, the yellow precipitate formed in the official methods, is soluble in dilute mineral acid and low results would necessarily follow if the zinc oxide failed to neutralize all the

acid formed in the reaction; or it may be possible that even though all the acid is neutralized, as shown by neutrality to litmus, the solution is not at the optimum p_H to obtain complete precipitation.

To investigate the cause of low yields the National Formulary Methods were modified in that sodium acetate was used in the place of zinc oxide with the expectation of higher yields. The official methods of assays beginning with the precipitation were then repeated using aliquots from the same solutions as were used in the assays reported in Table I. The results are shown in Table II with the amounts of sodium acetate used.

TABLE II.

Hypophosphite Salt.	Weight of Sample Gm.	Amount Found Gm.	Yield Per Cent.	Sodium Acetate Used Gm.
Sodium + H_2O	1.0008	1.0317	103.09	0.4
	1.0007	1.0317	103.10	0.4
	1.0007	1.0338	103.31	0.4
Potassium	0.9980	0.9916	99.36	0.4
	0.9982	0.9930	99.48	0.4
	0.9985	0.9930	99.45	0.4
Ammonium	1.0014	0.9878	98.64	0.4
	1.0013	0.9872	98.59	0.4
	1.0008	0.9870	98.62	0.4
Calcium	0.7503	0.7385	98.43	0.4
	0.7503	0.7425	98.96	0.4
	0.7503	0.7419	98.88	1.0
	0.7503	0.7442	99.19	1.0

Although these results do not fully explain the reasons for low yields obtained by the official methods, they are considerably higher and indicate an improvement in the methods. They show, however, that complete oxidation is obtained by the National Formulary Methods. By this modification, the four salts used in this experiment all conform to the minimum requirement of the National Formulary, and the yield is not affected by the amount of sodium acetate used.

Calculating the sodium salt on the anhydrous basis the results are 85.59, 85.59 and 85.77 per cent; these results indicating that this salt has lost part of its water of hydration.

GRAVIMETRIC METHOD.

As a method for comparison with the National Formulary and Modified Methods, a method used for the determination of hypophosphorous acid given in Treadwell and Hall (28), involving the oxidation to phosphate and determination of the phosphate by precipitating as magnesium ammonium phosphate from a hot solution following the method of B. Schmitz (29), was selected.

Neubauer (30) and Gooch (31) have shown that precipitation in the cold makes it difficult to obtain a pure precipitate of magnesium ammonium phosphate; sometimes the precipitate is contaminated with $Mg_3(PO_4)_2$ and sometimes with $Mg(NH_4)_4(PO_4)_2$. If, however, the precipitation takes place in a hot solution, a very pure, coarsely crystalline precipitate of $Mg(NH_4)PO_4$ is obtained (29). This is ignited to $Mg_2P_2O_7$ and weighed.

Reagents: Nitric Acid, 36% HNO_3.
Dilute Hydrochloric Acid 10 Gm. HCl/100 cc.
Ammonia (Sp. Gr. 0.90).
Ammonia, 1.5 Normal (1 in 10).
Ammonium Acetate C.P. Crystals.
Magnesia Mixture: Dissolve 55 Gm. of crystallized $MgCl_2$ and 105 Gm. NH_4Cl in water adding a little HCl (3 cc. dilute used) and diluting to a volume of 1 liter. For 0.1 Gm. P_2O_5 use 6 cc. of solution.
Phenolphthalein Indicator, 1 Gm./100 cc.

Procedure: A weighed amount of the dried hypophosphite salt equivalent to about 5 millimols is dissolved in 5 cc. of distilled water, 5 cc. HNO_3 added and the solution evaporated to

dryness on a water-bath. A 5-cc. portion of nitric acid is added to the residue and the evaporation to dryness repeated. The residue is dissolved in water, ammonia (sp. gr. 0.9) added until neutral to litmus and the solution finally diluted to 100 cc. Add a few drops of dilute HCl, an excess of magnesia mixture, 5 Gm. of ammonium acetate, and a few drops of phenolphthalein indicator. Heat nearly to boiling, run in 1.5*N* ammonia from a burette while constantly stirring until a turbidity forms. Stir till the precipitate is crystalline and then continue adding the ammonia until a red coloration is obtained. Allow the solution to cool completely, add one-fifth of its volume of ammonia (sp. gr. 0.9) and let stand at least four hours. Wash the precipitate three times by decantation with 1.5*N* ammonia, then transfer to a filter and wash free from chlorides with 1.5*N* ammonia. Finally moisten the precipitate with a small amount of 1.5*N* ammonia saturated with ammonium nitrate. Ignite very slowly, gradually increasing the heat until the precipitate is white. A muffle furnace is preferable, finally raising the temperature to 1000° C. and heating to constant weight.

A modified method is used for the calcium salt consisting in the addition of 3 Gm. of citric acid previous to precipitation. This modified method is also applicable to ferric hypophosphite.

To check the accuracy of this method the phosphate was determined on two pure samples of sodium phosphate. These samples were manufactured by different companies; sample "A" was Anhydrous Sodium Dibasic Phosphate C.P. and sample "B" the hydrated salt $Na_2HPO_4.12H_2O$ Analytical Grade. Sample "B" was recrystallized before using. Both samples were dried at 100° C. as recommended by Murray (32) and carefully assayed starting at the point "add a few drops of diluted HCl," etc. Table III shows the results obtained.

TABLE III.

Sample.	Weight of Sample Gm.	Amount Found Gm.	Deviation. Gm.	Deviation. Per Cent.
A	0.4466	0.4476	+0.0010	+0.22
B	0.4970	0.4972	+0.0002	+0.04
	0.5275	0.5282	+0.0007	+0.13
	0.5050	0.5059	+0.0009	+0.18

These results are satisfactory and although a trifle high, it is maintained that this method is as accurate as any of the phosphate methods. For this reason this method was used as a standard method of comparison, for those salts listed in Table IV. Throughout this investigation an electric muffle was used as results were found to be less accurate with a Fisher Burner probably due to incomplete conversion of the precipitate.

The results obtained by this method are shown in Table IV.

TABLE IV.

Hypophosphite Salt.	Weight of Sample Gm.	Amount Found Gm.	Yield Per Cent.
Sodium + H_2O	0.5004	0.5208	104.08
	0.5003	0.5216	104.26
	0.5003	0.5210	104.14
Potassium	0.4990	0.4984	99.88
	0.4991	0.4983	99.84
	0.4992	0.4988	99.92
Ammonium	0.5007	0.5006	99.98
	0.5006	0.5000	99.88
	0.5004	0.5008	100.08
Calcium	0.5370	0.5370	100.00
	0.5201	0.5203	100.04
	0.5205	0.5199	99.88

Calculating the sodium salt on an anhydrous basis the results are 86.40, 86.56 and 86.46 per cent. A moisture determination on this salt yielded residues representing 86.06 and 86.03 per cent agreeing with the results on analysis. The small difference may be due to decomposition of the salt at 110° C., the temperature used in drying.

The results show that the method as developed is applicable to the assay of the official hypophosphites. It gives accurate results, the only objection is that it is an indirect method. With the calcium salt it can be applied directly without first precipitating the phosphate as the molybdate compound, with the resultant saving of time. By this gravimetric method, more accurate results can be obtained by a double precipitation of the magnesium ammonium phosphate, and this procedure is recommended where large quantities of other salts are present.

BISMUTHATE METHOD.

In the selection of standard methods for comparison we have adopted the National Formulary Method for ferric hypophosphite. This rapid iodometric method yields excellent results and the iron content has been expressed as ferric hypophosphite.

In the same manner we have adopted the Bismuthate Method as our standard method for comparison for the Manganese salt. The manganese content of the salt was determined by this method as outlined in Treadwell-Hall (28), however, oxidizing the hypophosphite previously with nitric acid. This method yields consistent results as shown in Table V.

TABLE V.

Hypophosphite Salt.	Weight of Sample Gm.	Amount Found Gm.	Yield Per Cent.
Manganese + H_2O	1.5017	1.4752	98.24
	1.5017	1.4769	98.35
	1.5017	1.4756	98.26

PERMANGANATE METHOD.

Hypophosphites are oxidized by $KMnO_4$ in acid solution to phosphates and this reaction furnishes a basis for two methods as reported by Kolthoff (16) and the method given in the National Formulary Bulletin (21). Because these two methods are similar only the latter was selected for study. The National Formulary Bulletin Method was slightly modified and the following procedure adopted:

Accurately weigh about 0.7 Gm. of the salt and dissolve it in enough water to make a final volume of 500 cc. Place an aliquot of 50 cc. into a glass-stoppered flask, add 50 cc. of 0.1*N* $KMnO_4$ and 3 cc. of concentrated H_2SO_4; shake well and allow to stand over night in a dark place. Add 10 cc. of KI solution (20 Gm./100 cc.) and titrate the liberated iodine with 0.1*N* $Na_2S_2O_3$ until the solution becomes straw-color, then add 1 cc. of starch solution (0.5 Gm./100 cc.) and titrate until the solution becomes colorless. Carry out a blank determination at the same time. The difference between the two titrations with 0.1*N* $Na_2S_2O_3$ represents the equivalent amount of 0.1*N* $KMnO_4$ used in the oxidization.

The results are found in Table VI and the approximate time of standing is indicated.

TABLE VI.

Hypophosphite Salt.	Weight of Sample Gm.	Amount Found Gm.	Yield Per Cent.	Time Hours.
Ammonium	0.6159	0.6184	100.41	24
	0.6159	0.6188	100.47	24
	0.6159	0.6182	100.37	24
Sodium + H_2O	0.7893	0.8293	105.07	24
	0.7893	0.8287	104.99	24
	0.7893	0.8285	104.97	24
Potassium	0.7803	0.7757	99.41	12
	0.7803	0.7791	99.85	24
	0.7803	0.7864	100.78	36
	0.7803	0.7862	100.76	36

The yield by this method in most cases is in excess of 100 per cent and with the potassium salt the time was varied to note the relation of time to yield. Excessive yields are probably due to side reactions, impurities, etc., although a constant blank was obtained indicating that the oxidizing

agent is stable in the solution used. It is important, however, to add the acid immediately after the permanganate to prevent the complete conversion to MnO_2 in the neutral solution. If this occurs, complete oxidation is difficult to attain even on long standing. Because of the high results obtained no further work was done on this method.

BROMINE METHOD.

Investigations have been made showing that bromine can be used to completely oxidize hypophosphites. This reaction takes place in acid solution as shown by the following equation.

$$H_3PO_2 + 2Br_2 + 2H_2O \longrightarrow H_3PO_4 + 4HBr.$$
1 equivalent weight $Br_2 = {}^1/_4$ Mol. Wt. H_3PO_2.

Rupp and Kroll in determining calcium hypophosphite (24) state that the oxidation is made exactly as in the determination of phenol, while Marchott and Steinhauser in assaying hypophosphorous acid (23) used a similar method, but state that the presence of a large excess of mineral acid retards the oxidation.

The method of Rupp and Kroll for calcium hypophosphite was slightly modified and applied to all the salts and the following method adopted to determine hypophosphites.

Reagents: 0.1*N* Bromide-Bromate Solution.
(Koppeschaar's Solution.) Dissolve 3 Gm. $KBrO_3$ and 50 Gm. KBr in water and dilute to 1 liter.
0.1*N* Sodium Thiosulphate.
Potassium Iodide (20 Gm./100 cc.).
Diluted Sulphuric Acid (10 Gm./100 cc.).
Sodium Hydroxide Solution (10 Gm./100 cc.).
Starch Solution (0.5 Gm./100 cc.).

Procedure: Accurately weigh about 0.7 Gm. of the salt and dissolve in enough water to make a final volume of 500 cc. Place an aliquot of 50 cc. in a glass-stoppered 250-cc. volumetric flask, add 50 cc. of 0.1*N* bromide-bromate solution and 20 cc. of diluted sulphuric acid; stopper, shake well and allow to stand for 2 hours. Add 10 cc. of the potassium iodide solution, shake the flask, and titrate the liberated iodine with 0.1*N* sodium thiosulphate until the solution becomes straw color, then add 2 cc. of the starch solution and titrate until the solution becomes colorless. Carry out a blank determination in the same way. The difference between the two titrations with the 0.1*N* sodium thiosulphate when multiplied by the appropriate factor gives the amount of hypophosphite salt present.

For iron hypophosphite the above procedure is not applicable due to the insolubility of the salt and to the interference of the ferric ion with the final titration. Therefore, the following procedure was used:

Accurately weigh about 0.15 Gm. of the ferric hypophosphite and transfer to a 200-cc. volumetric flask with a glass stopper. Add 100 cc. of 0.1*N* bromide-bromate solution, 20 cc. of diluted sulphuric acid, stopper and shake well; allow to stand shaking occasionally until the salt is completely dissolved. Standing over night will usually dissolve all the salt. Then add an excess (30 cc.) of sodium hydroxide solution, cool and make to volume. Filter off the precipitate (ferric phosphate and hydroxide) and to an aliquot of 100 cc. add 10 cc. of potassium iodide solution, an excess of diluted sulphuric acid and titrate the liberated iodine with 0.1*N* sodium thiosulphate.

The results obtained by this method and modification for the iron salt are shown in Table VII. With each of the first five-named salts, aliquots from the same solution were used, and the results expressed on the basis of amount of salt found in the entire solution.

TABLE VII.

Hypophosphite Salt.	Weight of Sample Gm.	Amount Found Gm.	Yield Per Cent.
Sodium + H_2O	0.7484	0.7786	104.04
	0.7484	0.7797	104.18
	0.7484	0.7789	104.08

Potassium	0.7282	0.7249	99.55
	0.7282	0.7254	99.62
	0.7282	0.7262	99.73
	0.7282	0.7252	99.59*
Ammonium	0.6670	0.6665	99.79
	0.6670	0.6650	99.70
	0.6670	0.6656	99.79
Calcium	0.6225	0.6177	99.23
	0.6225	0.6181	99.29
	0.6225	0.6181	99.29
Manganese + H_2O	0.6532	0.6421	98.30
	0.6532	0.6421	98.30
	0.6532	0.6424	98.35
Ferric	0.1528	0.1526	99.87
	0.1525	0.1525	100.00
	0.1513	0.1513	100.00

* Time of standing 6 hours.

Calculating the sodium salt on the anhydrous basis the yields are 86.37, 86.49 and 86.41 per cent.

This method is simple and rapid and presents no difficulties. The bromide-bromate solution keeps very well, no appreciable change being detected after standing six months. It was also found that it is not necessary to run a blank each time as a constant blank was obtained. A factor was obtained by adding 10 cc. of the potassium iodide solution to 50 cc. of the bromide-bromate solution, acidifying with 20 cc. of dilute sulphuric acid and titrating with 0.1*N* sodium thiosulphate solution. As mentioned above this factor remained constant during the time of investigation of the salts although the sodium thiosulphate was standardized against potassium dichromate at frequent intervals.

COMPARISON AND DISCUSSION OF RESULTS.

For the purpose of comparison, the average yields from the different methods (Tables I to VII, except III) are listed in Table VIII.

TABLE VIII.

Hypophosphite Salt.	National Formulary Methods Table I Per Cent.	National Formulary Methods Modified Table II Per Cent.	Gravimetric Method Table IV Per Cent.	Bismuthate Method Table V Per Cent	Permanganate Method Table VI Per Cent.	Bromine Method Table VII Per Cent.
Sodium + H_2O	100.03	103.16	104.17	...	105.01	104.10
Potassium	96.90	99.43	99.88	...	100.46	99.63
Ammonium	95.85	98.62	99.98	...	100.42	99.76
Calcium	96.51	98.87	99.97	...	....	99.27
Manganese + H_2O	90.18	....	....	98.28	....	98.32
Ferric	99.87	....	....	...	....	99.96

As a basis of comparison for the first four salts we used the Gravimetric Method, for the manganese salt the Bismuthate Method, and for the iron salt the National Formulary Method. It is noted, however, that for the manganese and ferric salts we used the Law of Definite Proportions as a basis for our comparison.

With the acceptance of methods for comparison for all the salts, we are now in a position to discuss the methods of assay individually and find: The National Formulary Methods are unsatisfactory for the following reasons:

1. The methods are indirect ones, determining total phosphates rather than hypophosphites.

2. Although consistent results are obtained by the methods, all the results are low.

3. Some difficulty was encountered with the end-point in titrating the excess silver nitrate with 0.1*N* thiocyanate, a tendency for the end-point to fade being noted.

4. No provision is made for the volume occupied by the undissolved zinc oxide.

5. Although the actual determination of the phosphate is rapid, considerable time is involved in converting the salts to phosphates.

6. The method for ferric hypophosphite is not subject to these criticisms, since excellent results are obtained.

The National Formulary Methods, Modified, are an improvement on the National Formulary Methods for the following reasons:

1. Higher yields are obtained which approach the theoretical as determined by the Gravimetric Method. These yields indicate that sodium acetate is superior to zinc oxide as a buffer.

2. The methods are subject, however, to the criticisms listed in items 1, 3 and 5, under the National Formulary Method.

3. These methods may be used to replace the present official methods although the results are only partially satisfactory.

The Permanganate Method is considered unsatisfactory for the following reasons: 1. The length of the time of standing is objectionable. 2. High results are obtained in excess of the theoretical indicating side reactions, reactions with impurities, etc. 3. The method is apparently not applicable to all of the official salts.

The Bromine Method as developed is very satisfactory for the following reasons: 1. The method is simple and rapid. A complete assay can be run in about two and one-half hours for any of the salts with the exception of the iron salt which requires a longer time. 2. The method is a direct one. 3. The method yields excellent results. For the first four salts listed (Table VIII) close agreement is noted with the Gravimetric Method. With the manganese salt almost identical results are obtained by this method and the Bismuthate Method, and likewise with the iron salt, the results by this method agree remarkably well with those obtained by the National Formulary Method. 4. It can be made applicable to all the official salts. In the case of the iron salt, this method is about as rapid as the National Formulary Method and the results obtained may be of greater value. 5. It is suggested that this method replace the present National Formulary Methods for the official hypophosphites.

CONCLUSIONS.

1. The National Formulary Methods of Assay for Ammonium, Calcium, Potassium, Sodium and Manganese Hypophosphites give unsatisfactory results.

2. The National Formulary Method of Assay for Ferric Hypophosphite yields excellent results.

3. Modified National Formulary Methods of Assay for Ammonium, Calcium, Potassium and Sodium Hypophosphite give results nearer the theoretical than the National Formulary Methods of Assay.

4. The Permanganate Method is unsatisfactory due to its length and excessive yields.

5. The Gravimetric Method developed for the assay of the official hypophosphite salt, while not applicable to the manganese salt, is satisfactory. The method is simple and accurate.

6. The Bromine Method has been developed for assaying the official hypophosphites, and is applicable to all the official salts. The method is simple, rapid and accurate.

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EVALUATION OF A DETERIORATION FACTOR IN LIQUID PETROLATUM.*[1]

BY P. L. BURRIN, A. G. WORTON AND F. E. BIBBINS.

INTRODUCTION.

The fact that some samples of liquid petrolatum develop peculiar odors when stored under optimum conditions, while other samples stored under the same con-

* Scientific Section, A. PH. A., Portland meeting, 1936.

[1] From the Control Laboratories, Eli Lilly and Company.

ditions do not develop these objectionable odors, led the authors to search for a method of determining this factor. Every one will agree that much progress has been made in producing and purifying mineral oils, and that the oil which is offered on the market to-day is more stable than any oil that could have been purchased a few years ago. Nevertheless, there are oils offered to-day that meet the specifications of the United States Pharmacopœia, which after standing several months on the pharmacist's shelves will display a variety of disagreeable odors and tastes. The pharmacist and pharmaceutical manufacturer indeed have a task in selecting a satisfactory oil by any rapid scientific means, which at the same time will assure a stable product over a period of long aging.

The obvious method of testing samples of liquid petrolatum by storing them at an elevated temperature for a long period of time is satisfactory, but it is time-consuming. It is not practical at all to have to wait many weeks for the results of a test, to determine the advisability of purchasing a certain lot of mineral oil.

There has never been available for pharmacists and chemists a reliable and efficient stability test for liquid petrolatum. The United States Pharmacopœia and British Pharmacopœia since the beginning of the century have required that liquid petrolatum shall not impart more than a pale brown color to a layer of concentrated sulphuric acid after heating for ten minutes at 100° C. with frequent agitation. In this test the depth of color roughly measures the amount of carbonizable substance present. These official volumes have also required that a mixture of the oil, absolute alcohol, and sodium hydroxide solution saturated with lead oxide remain colorless after having been heated at 70° C. for ten minutes. This indicates the absence of sulphur, a common impurity in inferior petroleums from certain geographical sources (1). The British Pharmacopœia has also required that liquid petrolatum when heated on platinum foil be completely volatilized and not give off acrid vapors. These tests give only a fair estimate of the quality of an oil, and are not delicate enough to differentiate anything but a grossly impure oil from a high-grade oil.

The American refineries began to refine Pennsylvania, Mid Continent and California oils when the World War cut off the supply of Russian oils (2). The American oils, being saturated hydrocarbons of the methane series, are much more stable than the Russian oils, which are hydrocarbons of the benzene series or naphthenes, and are considered as hydrogenated aromatic hydrocarbons (3). The tests of the United States Pharmacopœia and British Pharmacopœia which seemed adequate for the relatively unstable Russian oils became inadequate for the saturated paraffins of America.

DISCUSSION.

Schau and Nielsen in a recent paper demonstrate a method whereby the stability of an oil may be measured spectroscopically. They examined eleven samples and found them all to have an ultraviolet absorption band with a maximum at about 2730 Å. and a minimum at about 2500 Å. The amount of absorption, and therefore the height of the absorption band, was found to be proportional to the depth of color developed in the sulphuric acid test. This spectroscopic method has a great advantage over the acid test in that it gives a numerical result instead of a comparative color. Unfortunately, few laboratories have good spectroscopes and skilled men to operate them (4).

Arditti reported in 1931 that he measured the stability of paraffin oil containing no sulphur compounds by air oxidation. This was carried out by bubbling air through the hydrocarbon oil at different temperatures and measuring the change in interfacial tension between 0.02*N* sodium hydroxide and the oil to determine the amount of oxidation. No oxidation took place at 15° C., but sixteen hours at 110° C., three hours at 123° C. and one-half hour at 150° C. showed very marked changes (5).

Green and Schoetzow in 1932 proposed exposing liquid petrolatum in flint-glass bottles to sunlight and ultraviolet light for a relatively short time to measure stability (1).

EXPERIMENTAL.

Several attempts were made by the authors to devise a test method before a satisfactory one was found. Most of these trials gave vague or inaccurate results.

Method No. 1.—The first attempt to differentiate high-grade from low-grade oils consisted of a simple aging test. Nine samples in cork-stoppered bottles were placed in a hot room at 45° C. to bring about a more rapid polymerization and oxidation than occurs at normal temperatures. At the end of six months when the bottles were opened for a comparison of odors only three of the oils possessed an unmistakably detectable odor. Any further differentiation in the quality of these oils with accuracy was impossible. The results obtained by this method do not justify the time involved in carrying it out.

Method No. 2.—To bring about a more rapid oxidation and development of odors by which to measure the oxidation, eleven oils were introduced into bottles with tin-lined caps, and all were placed in an oven for two weeks at 80° C. When the oils had cooled they were examined for odor. The results of this test are recorded in Table I.

TABLE I.

Sample.	Odor.	Sample.	Odor.	Sample.	Odor.
A	None	E	Odor	I	Odor
B	Slight odor	F	Odor	J	Strong odor
C	Odor	G	Odor	K	Strong odor
D	Odor	H	Odor		

That aging at 80° C. is superior to aging at 45° C. in testing liquid petrolatum may readily be seen. However, this test is far from being satisfactory in that it only distinguishes between the very good oils and the very poor ones.

Method No. 3.—L. Sonneborn and Sons, Inc., recently submitted to the authors an accelerated method for determining resistance of liquid petrolatums to heat and light. The method consists of subjecting the oil to twenty pounds steam pressure for one hour; allowing it to cool, and finally examining it for objectionable odor. Eleven oils were subjected to this test, the results of which are given in Table II.

TABLE II.

Sample.	Odor, Steam Pressure Method.	Sample.	Odor, Steam Pressure Method.	Sample.	Odor, Steam Pressure Method.
A	None	H	Slight	F	Strong
C	None or very, very slight	J	Slight	I	Strong
B	Very, very slight	E	Odor	K	Strong
D	Very slight	G	Odor		

Comparing Table I with Table II reveals that generally the effects of dry heat and that of steam on liquid petrolatums are parallel.

This method has the advantage of rapidity of performance; however, like many odor tests it is not entirely dependable because of the personal element involved.

Method No. 4.—The Standard Oil Co. of Indiana submitted a method for measuring colorimetrically, the quantity of peroxides developed after heating the oil for forty hours in a steam-bath at 211° F. The colorimetric reagent consists of an aqueous and acetone solution of ferrous sulphate, ammonium sulphocyanate and sulphuric acid. The color is developed when the reagent is shaken with the oil, the peroxides of which convert a portion of the ferrous ions to ferric ions which combine with the sulphocyanate ions to produce a dark red color. Three samples, B, I and J, were heated at 211° F. in a steam-bath in flasks with long side-arms to admit air for the oxidation. Sample I colored the reagent dark red after heating for twelve hours, while B and J gave no color reaction after heating seventy-three hours. Sample B was known to possess greater stability than J although the test did not signify it after seventy-three hours' heating. The authors found this method to be impractical because of the great amount of time required to carry it out.

Method No. 5.—Obviously a quicker and more accurate method to determine the stability of liquid petrolatums was desirable. The authors conceived the idea of measuring the peroxides which are readily developed in some of these oils after subjecting them to twenty pounds steam pressure for one hour. The ferrous sulphate and ammonium sulphocyanate reagent of the Peroxide Method was used for this purpose.

Ten oils were subjected to steam pressure, and then examined for peroxides. The results of this procedure together with those of the steam pressure method are given in Table III.

TABLE III.

Sample.	A. P. M. I.	Odor Index Steam Pressure Method.	Sample.	A. P. M. I.	Odor Index Steam Pressure Method.
A	1	1	F	6	7
B	2	2	G	7	9
C	3	3	H	8	6
D	4	4	J	9	8
E	5	5	K	10	10

The results recorded in Table III are interpreted numerically from 1 to 10. The greater the numerical index, in either the A. P. M. I. column or the odor column, the greater the amount of peroxides or the stronger the odor in a given sample, *e. g.*, sample K with an A. P. M. I. of 10 and an odor index of 10 contains the greatest amount of peroxides and also possesses the strongest odor of any of the 10 samples. A. P. M. I. is the Accelerated Peroxide Method index.

It is significant that the results of the odor tests, using both dry heat and steam, very closely parallel the Accelerated Peroxide Method in measuring the stability of liquid petrolatums. However, it is more significant that oils known from experience to be unstable contain the greatest amounts of peroxides.

REAGENTS.

Solution A is made by dissolving 10 Gm. of ferrous sulphate in 500 cc. of distilled water to which has been added 10 cc. of concentrated sulphuric acid and 1 Gm. of potassium sulphocyanate. (Use glassware cleaned with chromic acid and be certain to use uneffloresced crystals of ferrous sulphate, and sulphocyanate.) After the ferrous sulphate has dissolved add 1000 cc. of commercial acetone. Filter the acetone if taken from a can to insure against contamination with rust. The resulting solution is gently refluxed on a steam-bath in the presence of clean iron wire, and it is protected from oxygen by introducing a stream of nitrogen or carbon dioxide

into the top of the refluxing condenser. Be certain the iron wire has no minute rust spots. If doubtful get new wire or rub down the questionable wire with sandpaper. Use a cork covered with heavy tinfoil between the flask and condenser while refluxing. Protect this reagent from air by keeping the containers filled with carbon dioxide or nitrogen. The *colorless solution* is stored in sealed, hard glass bottles containing a piece of clean iron wire. It is well to rinse the bottle with a small amount of the reagent before filling.

Caution should be used in handling the sealed bottles of test solution A, and the testing solution, since considerable pressure develops in storage. It is recommended that stored bottles be not more than one-half to two-thirds full.

Solution B is made by dissolving 10 Gm. of potassium sulphocyanate in 500 cc. of distilled water.

The testing solution consists of three volumes of solution A and one volume of solution B. Store in a hard glass bottle containing a small piece of clean iron wire. Here again, do not allow the solution to come in contact with the air. This solution is ready to use when it is *colorless* or possesses a slate-gray cast. Oftentimes the solution is tinted when first mixed but becomes colorless upon standing for a few hours.

TEST METHOD.

Add 100 cc. of the oil to be tested to a screw-capped, wide-mouth, 8-ounce jar with the entire paper liner removed from the cap. Place the jar in an autoclave after making certain that the screw cap is adjusted very loosely so that steam may enter the bottle. Adjust the steam pressure to twenty pounds, maintaining it for one hour, then remove the sample from the autoclave and allow it to cool. Wipe the moisture from the inside of the cap. Add 10 cc. of the sample to a 10-cc. graduated test-tube, then pipette in 5 cc. of the colorless *testing solution*. (Be certain to replace the air in the test-tube and in the bottle of testing solution with carbon dioxide or nitrogen.) Tightly stopper with a new cork and shake for thirty seconds, then allow the aqueous layer to separate. If the aqueous layer is colorless, the oil contains no peroxides. A pink or red color in the aqueous layer shows the presence of peroxides. A control of 10 cc. of liquid petrolatum and 5 cc. of the colorless testing solution should always be set up.

SUMMARY.

It may be said that peroxides are formed when deterioration takes place in liquid petrolatum. It may also be said that subjecting liquid petrolatum to twenty pounds pressure under steam for one hour ages it immediately, and develops peroxides that would ultimately be developed upon long aging.

Furthermore; it may be said that following the treatment with steam, an odor from the oil roughly indicates the presence of peroxides and that the ferrous sulphate and sulphocyanate testing solution of the Accelerated Peroxide Method very delicately detects the presence of peroxides.

Finally, oils intended for medicinal purposes, which can be made to develop large amounts of peroxides readily, will develop a disagreeable odor and taste when stored on the pharmacist's shelves. The rapidity of this normal deterioration is indicated roughly by the amount of peroxides formed.

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FLUIDEXTRACT OF ERGOT: EFFECT OF ACIDITY ON BIOLOGIC ACTIVITY AS DETERMINED BY U. S. P. 1935 REVISED ASSAY.*

BY F. F. BERG.[1]

INTRODUCTION.

Fluidextract of Ergot has been a subject of extensive investigation over a period of many years. Revision Committees of the United States Pharmacopœia have agreed through several revisions upon the advisability of using an acid medium in the extraction of ergot.

In recent years with more effectively controlled methods of physiological assay available, attention has been directed not only to the influence of acid upon the yield of ergot alkaloids but also to its influence upon the stability of these alkaloids. The results of this work are reflected in the use of hydrochloric acid in both the extraction and dilution menstrua in the recent interim revision monograph on Fluidextract of Ergot of the U. S. P. X.

Early in 1930 a series of experiments was undertaken with the object of further determining the possible value of varying the amount of acid used in the extracting medium. A series of fluid extracts was prepared from the same lot of defatted drug. The menstrua contained, respectively, 10, 20, 30, 40 and 50 cc. of hydrochloric acid in 1000 cc. dilute alcohol.

For purpose of minimizing influences other than acidity the extracts were stored in the dark in small, well-filled, sealed containers. Samples were assayed over a period of approximately three years.

The general indication of the results was to the effect that the greater the acidity of the menstruum and therefore of the resultant extract the greater was the initial and maintained activity of the extract; this apparently confirmed previously expressed opinions and observations as to the influence of acidity on the stability of Fluidextract of Ergot. However, certain unexplained irregularities in the findings and a careful scrutiny of the numerous cocks comb assays of samples which were carried out during this period suggested the possibility that the increased acidity of some of the extracts might in itself be a factor in the observed higher activity of the samples as determined by the cocks comb assay.

With this in mind experiments were carried out for the purpose of determining whether or not the acidity of Fluidextract of Ergot is a factor in the Bio-assay value.

EXPERIMENTAL.

Assay Method—Procedure and Method of Calculation.—The tests were carried out on flocks of 35–45 white leghorn cockerels weighing approximately 2 kilos each, an entire flock being used for one day's test. The flock was divided into four equal groups, two of which received doses of the standard sample and two the test samples. The birds in each group all received the same dose, two dose levels being employed for both standard and test sample. The doses, which ranged from 0.1 to

* Scientific Section, A. PH. A., Portland meeting, 1935.

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0.2 cc. per kilo of bodyweight, were injected into the breast muscle and the effect, expressed as the percentage of the comb area in which darkening occurred, was recorded one, one and one-half and two hours afterward. For purposes of calculation the average of the two highest of these readings was used. Using the group averages, the activity of the test sample relative to the standard was obtained from a dose-effect graph in which the logarithms of the doses were plotted against the effects expressed as percentage of the comb area in which darkening occurred. After an interval of ten days or more the test sample and the standard were again compared, using the same flock of birds but using for the test sample the birds employed for the standard in the first day's test and for the standard the birds previously used for the test sample.

PREPARATION OF SAMPLES.

In four series of experiments sets of samples of Fluidextract of Ergot and ergotoxine ethanesulphonate were prepared by additions of hydrochloric acid, tartaric acid or sodium hydroxide, as required, to obtain specific adjustments of p_H.

For Experiment I.—To one volume Fluidextract Ergot B, 188 (made with menstruum containing 40 cc. hydrochloric acid per liter) (p_H 3.0) was added:

(*a*) 0.225 volumes of 1 *normal* NaOH to neutralize one-half of the hydrochloric acid used in the extraction—p_H of adjusted fluid extract was 5.0.

(*b*) 0.45 volumes of 1 *normal* NaOH to neutralize all of the hydrochloric acid used in the extraction—p_H of adjusted fluid extract 6.8.

For Experiment II.—(*a*) A Fluidextract Ergot (1 cc. of extract equivalent to 1 Gm. of drug) was prepared by extraction of the ground drug with 45% aqueous solution ethyl alcohol; p_H of the extract was 5.7.

(*b*) A portion of the 45% alcoholic extract was adjusted to p_H 3.2 by addition of concentrated hydrochloric acid.

For Experiment III.—(*a*) A Fluidextract Ergot was prepared with 45% solution of ethyl alcohol in exactly the same manner as Experiment II. The p_H of the extract was 5.7.

(*b*) Concentrated hydrochloric acid was diluted with 40% alcohol to 0.16*N*.

For Experiment IV.—(*a*) A solution of ergotoxine ethanesulphonate was prepared by dissolving 0.5 mg. per cc. of the salt in 1% aqueous tartaric acid; p_H of solution 2.0.

(*b*) A solution of ergotoxine ethanesulphonate was prepared by dissolving 0.5 mg. per cc. of the salt in 0.25% aqueous tartaric acid, p_H of solution 3.1.

(*c*) An aqueous solution of ergotoxine ethanesulphonate was prepared by suspending 0.5 mg. per cc. of the salt in double distilled water and adding a trace of tartaric acid to clarify the solution; p_H of solution 5.0.

RESULTS.

The physiological activities of the above-described experiments were determined by the assay method given and the results calculated in terms of activity ratios as follows:

Experiment I.—Fluidextract of Ergot compared to same with acid in extract one-half neutralized, and acid in extract completely neutralized. Alkali added immediately before injections.

Sample.	p_H of Sample.	Dose Injected Cc./Kg.	% Average Area Cyanosis for Number Birds Indicated in Parentheses. First Test.	Second Test.	Third Test.	Relative Activity Calculated from Lot-Dose—% Area Effect Correlation Graphs. First Test.	Second Test.	Third Test.	Weight Av. Value Relative Activity.
Fldext. Ergot B No. 188	3.0	0.13	33.3 (10)	30.2 (10)	19.2 (9)	1.00	1.00	1.00	1.00

Same. 0.225 Vol.									
N—NaOH	5.0	0.13	20.3 (10)	25.5 (9)	19.0 (10)	0.677	0.869	1.00	0.85
Fldext. Ergot B		0.9	42.5 (11)			1.00			
No. 188	3.0	0.13	33.3 (10)	30.2 (10)	19.2 (9)	1.00	1.00	1.00	1.00
		0.11	43.2 (10)	34.5 (10)		1.00	1.00		
Same. 0.45 Vol.		0.9	29.6 (7)			0.542			
N—NaOH	6.8	0.13	15.3 (9)	21.2 (10)	19.5 (10)	0.577	0.762	1.00	0.683
		0.11	19.5 (10)	20.3 (8)		0.500	0.662		(6 tests)

Experiment II.—Fluidextract of Ergot—prepared with 45% neutral alcohol compared to same with p_H adjusted to 3.2.

Sample.	p_H of Sample.	Dose Injected.	% Av. Area Cyanosis for Number Birds Indicated in Parentheses. First Test.	Second or "Crossover" Test.	Relative Activity Calculated from Lot—% Area Effect Correlation Graphs. First Test.	Second Test.	Weight Av. Value Relative Activity.
45% alcohol extract ergot, no adjustment	5.7	0.25 cc./Kg.	15.7 (10)	27.3 (11)	1.00	1.00	1.00
		0.30	15.5 (11)	38.2 (11)	1.00	1.00	
45% alcohol extract ergot, p_H adjusted by addition concd. HCl	3.2	0.25	26.6 (11)	49.2 (9)	1.32	1.44	1.32
		0.30	38.2 (11)	46.8 (11)	1.33	1.117	

Experiment III.—Fluidextract of Ergot prepared with 45% neutral alcohol compared to same with 0.16*N* HCl in 40% alcohol injected in opposite breast muscle of test birds.

Sample.	p_H of Sample.	Dose Injected.	% Av. Area Cynosis for Number Birds Indicated in Parentheses. First Test.	Second or "Crossover" Test.	Relative Activity Calculated from Lot—% Area Effect Correlation Graphs. First Test.	Second Test.	Weight Av. Value Relative Activity.
45% alcohol extract ergot	5.7	0.3	28.0 (11)		1.00		1.00
		0.45	30.3 (9)		1.00		
No adjustment " " injected in left breast muscle / Dil. HCl—0.16*N* in 40% alcohol injected in right breast muscle of same birds	5.7	0.3	25.8 (9)		1.073		0.93
		0.45	38.2 (7)		0.778		

Experiment IV.—Solution ergotoxine ethanesulphonate 0.5% in double-distilled water—trace of tartaric acid to clarify compared to 0.5% ergotoxine ethanesulphonate in 1.0% tartaric acid.

Ergotoxine ethanesulphonate 0.5% in double-distilled water (trace tartaric acid added to clarify)	5.0	0.08	21.7 (13)	25.0 (13)	1.00	1.00	1.00
		0.12	30.5 (9)	49.7 (12)	1.00	1.00	
Same in 1.0% tartaric acid	2.0	0.08	24.4 (13)	37.6 (13)	1.16	1.23	1.28
		0.12	47.6 (9)	63.2 (9)	1.48	1.25	

Experiment V.—Same as IV in 1% aqueous tartaric acid compared to 0.5% E. E. S. in 0.25% tartaric.

3.1	0.075	23.8 (12)	1.00	1.00
	0.10	33.4 (11)	1.00	
2.0	0.075	21.9 (11)	0.946	
	0.10	31.1 (11)	0.930	0.938

SUMMARY AND CONCLUSIONS.

1. Neutralization in two stages (to p_H 5.0 and to p_H 6.8) of an acid Fluidextract of Ergot (p_H 3.0) at the time of injection resulted in a decrease proportional to the amount of alkali added, of the apparent activity of the sample as determined by the U. S. P. X 1935, Interim Revision Cocks Comb Physiological Test.

2. Since adjustment of the p_H of a clear neutral alcohol extract of ergot from 5.7 to 3.2 by addition of hydrochloric acid resulted in an increase of 32 per cent in the apparent activity of the sample, it is concluded that the apparent decrease in activity which followed neutralization of the acid fluid extract was not related to any effect of the added alkali upon the sample.

3. Since simultaneous injection of an amount of hydrochloric acid—equivalent to that present in U. S. P. X Fluidextract of Ergot 1935, Interim Revision into the breast muscles of a series of cockerels opposite to that in which a neutral alcohol Fluidextract of Ergot was injected did not increase the apparent activity of the fluid extract as compared to the activity observed in a second series of cockerels simultaneously injected with the neutral Fluidextract of Ergot alone—it is concluded that the observed influence of the degree of acidity of Fluidextract of Ergot upon the apparently physiological activity of the same is not related to any systemic factor but rather is to be explained in terms of rate of absorption of the ergot alkaloids from the site of injection in the breast muscle.

4. Ergotoxine ethanesulphonate solution prepared according to U. S. P. X 1935, Interim Revision to contain 0.5 mg. per cc. dissolved in aqueous solution of tartaric acid 1 in 100 (p_H 2.0) showed an apparent physiological activity 28 per cent greater than that of an aqueous solution of ergotoxine ethanesulphonate 0.5 mg. per cc. p_H 5.0 to which a trace of tartaric acid had been added to clarify the solution. Comparison of the 0.5 mg. per cc. solution of ergotoxine ethanesulphonate solution in 1 per cent tartaric acid to ergotoxine ethanesulphonate solution 0.5 mg. per cc. dissolved in aqueous tartaric acid 0.25 in 100 (p_H 3.1) showed the latter to have an apparent activity 6 per cent more than the former. It is concluded that the apparent activity of ergotoxine ethanesulphonate, as determined by the U. S. P. X 1935, Interim Revision Cocks Comb Test, is influenced in the same way by the acidity of the solution in the same manner as is Fluidextract of Ergot but probably to a lesser extent.

5. It is concluded from the results presented in this communication that the U. S. P. X Bio-assay value of samples of Fluidextract of Ergot may be materially influenced by the acidity of the solutions which are injected in this assay. This suggests the desirability of including in the U. S. P. XI monograph on Ergot a specification in the assay procedure as to adjustment of ergot solutions for purpose of injection to a stated p_H.

The biological assays and tabulations used herein were prepared by the Biological Research Laboratories of E. R. Squibb & Sons, and I gratefully acknowledge their assistance.

THE STABILIZATION OF MILK OF MAGNESIA BY CITRIC ACID.*

BY E. C. BILLHEIMER AND F. W. NITARDY.[1]

An investigation has been made of the stability of milk of magnesia on long aging at elevated temperatures in containers of various types of glass. It has been determined that if milk of magnesia is stored in an ordinary glass bottle at temperatures approximating summer heat, it will develop excessive alkalinity and a bitter, unpleasant taste. The change may be retarded by using a harder, more resistant glass for the container, and can be almost entirely prevented within practical limits by the use of a pyrex glass container. However, because of the excessive cost of pyrex glass bottles for use as market containers for milk of magnesia, it became necessary to investigate other means of stabilizing the product against deterioration, even when packaged in the ordinary glass bottle.

It has been determined that the increase in alkalinity of milk of magnesia when stored under these conditions, and the development of a bitter taste, are due to reaction of the product with the glass bottle. This is shown by the fact that when a non-soluble glass is used, the changes are greatly retarded or entirely prevented. The same result can be accomplished, however, by adding a very small percentage of citric acid to the milk of magnesia, which appears to interfere with the action of the milk of magnesia on glass, possibly because of its buffering action, and greatly extends the period during which milk of magnesia will remain in its original state of alkalinity and taste, even when stored in an ordinary glass bottle. Milk of magnesia to which has been added 0.15% citric acid develops no bitter taste and no increase in alkalinity even after exposure to a temperature of 100° C. for over 250 hours, whereas uncitrated milk of magnesia turns excessively alkaline and quite unpalatable and bitter in 75 hours under the same treatment; 0.1% of citric acid seems to be sufficient for practical purposes.

A standardized testing procedure was developed whereby measurement could be made of the comparative stability of samples of milk of magnesia in glass bottles when exposed at elevated temperatures for long periods of time. This consisted of filling the bottle with the milk of magnesia, attaching a reflux condenser so that no loss of water would occur by evaporation, and immersing the bottle up to the shoulder in a bath at 100° C. Samples of the milk of magnesia were then removed at intervals for tasting and for measurement of change in alkalinity. This testing procedure was found on repeated trials to give quite reproducible results and was used entirely throughout this comparative study. A temperature of 100° C. is, of course, higher than would ever be encountered in the market, but since the deterioration of the milk of magnesia occurs through the reaction between it and the glass, and the speed of the reaction is greatly influenced by temperature, this elevated temperature was chosen to accelerate the rate of change. It produces the same effect which would otherwise occur much more slowly at ordinary temperature.

Tests were made on a large series of compounds, including various organic acids and salts, to determine their value for the stabilization of milk of magnesia.

* Section on Practical Pharmacy and Dispensing, A. PH. A., Portland meeting, 1935.

[1] Chemical and Pharmaceutical Laboratories, E. R. Squibb & Sons, Brooklyn, N. Y.

Several of them gave some protection, others either had little or no stabilizing effect or were unsatisfactory for other reasons, such as imparting an objectionable taste to the product or otherwise influencing its physical properties. Citric acid in suitable quantity, which of course forms and is present as magnesium citrate, seemed definitely superior to the others, had no appreciable effect in itself on the taste of milk of magnesia, and gave very decided stabilization even at high temperature. Samples of milk of magnesia were prepared which contained 0.5 Gm., 1.0 Gm., 1.5 Gm. and 2.0 Gm., respectively, of citric acid per liter, and exposed to a temperature of 100° C. under the conditions of the test previously described. A control sample of the same milk of magnesia without citric acid was included. It was found that the uncitrated milk of magnesia developed an incipient bitter taste after forty hours' exposure to this temperature, and a pronounced bitterness after 75 hours. The sample containing 0.5 Gm. of citric acid per liter had a slight bitter taste after 94 hours' heating and a pronounced bitterness after 135 hours. The use of 1.0 Gm. citric acid per liter gave somewhat more protection, as incipient bitterness was not observed until 195 hours and pronounced bitterness until 255 hours of heating. However, the presence of 1.5 Gm. of citric acid per liter, as well as 2.0 Gm., apparently stabilizes the milk of magnesia against development of bitter taste. Only a faint trace of bitterness was noticeable after 275 hours, and after 370 hours of heating at 100° C., the product containing 1.5 Gm. per liter was still practically free from bitter taste. The milk of magnesia containing 2.0 Gm. per liter did not develop a trace of bitter taste even after 370 hours of heating. However, since exposure at 100° C. for 250 hours is a more severe test than exposure to summer temperature for a year or more, 1.0 Gm. per liter, or 0.1% citric acid, in milk of magnesia is apparently all that is required for practical purposes to protect the product under conditions encountered in national marketing operations, as no deterioration was observed in extended marketing tests covering several years with milk of magnesia containing even slightly less than 0.1% of citric acid. Measurements on the alkalinity of these samples of milk of magnesia showed also that the citric acid, in addition to preventing the development of bitter taste, greatly retarded increase in alkalinity through reaction with the glass bottle. This method of stabilization of milk of magnesia with citric acid has been offered to, and accepted by the U. S. Pharmacopœia.

CONCLUSIONS.

1. Milk of magnesia on storage at summer temperature in ordinary glass bottles will undergo deterioration through reaction of the product with the glass. This results in a considerable increase in alkalinity and the development of an unpleasant bitter taste.

2. The increase in alkalinity and development of a bitter taste can be produced in a much shorter time by exposure to a higher temperature, such as 100° C., and a testing procedure has been developed for comparing the stability of variously treated samples of milk of magnesia.

3. The composition of the glass bottle definitely influences the change which occurs in the milk of magnesia on prolonged storage or at high temperatures. The change can be retarded by using a harder, less soluble glass, and practically eliminated by using pyrex glass bottles.

4. The addition of citric acid to milk of magnesia will stabilize it against development of bitter taste and increase in alkalinity in an ordinary glass bottle even on storage at elevated temperatures; 0.1% of citric acid seems to be sufficient for all practical purposes.

The assistance given the authors by various workers in the Squibb Research and Control Laboratories is hereby gratefully acknowledged.

WILLIAM WITHERING AND THE INTRODUCTION OF DIGITALIS INTO MEDICAL PRACTICE.*

BY LOUIS H. RODDIS.[1]

"The Botanical Professor gives annually a gold medal to such of his pupils se are most industrious in that branch of science. . . .It will hardly have charm enough to banish the disagreeable ideas I have formed of the study of botany." This is the view of the "Gentle Science" held by one, when a medical student at the University of Edinburgh, who was to be one of the greatest of English botanists and, perhaps, the greatest medical botanist.

William Withering, the discoverer of the use of digitalis, was born in Shropshire, England, on March 17, 1741. Shropshire is one of the most beautiful counties of England, and its position adjacent to Wales gives it a record of historical tradition similar to the counties on the Scottish border. The English call tha county Salop and its residents Salopians. The highest point in the county, near Withering's birthplace, is a small mountain called the Wrekin, and the local toast is "To all around the Wrekin." The oaks of Shropshire are so celebrated that that tree is often referred to as the "Shropshire weed." A plant that also grew like a weed around every cottage and along every path was the foxglove (*Digitalis purpurea*).

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At Edinburgh, Withering had among his professors such men as Cullen, the author of the celebrated "Practice of Medicine" and the famous anatomist, Alexander Monro, who was distinguished from his equally famous son by the title of Monro *primus*. This son, Monro *secundis*, was succeeded by *his* son, Monro *tertius*. The professorship in anatomy was held at Edinburgh by these three Monros for over 125 years, an example of a real medical dynasty.

After graduating in 1766, Withering went to the little town of Stafford, where he remained for nearly ten years as a country doctor. His practice here was not so large but that he had plenty of opportunity to study botany and mineralogy.

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* Section on Historical Pharmacy, A. PH. A., Portland, meeting, 1935.

[1] Commander, Medical Corps, United States Navy.

There is a romantic story relative to his beginning as a botanist. The young lady whom he afterward married was one of his patients. She was an amateur artist, and it was to obtain objects for her pencil and brush that he began to collect flowers and plants of the vicinity. Feminine charms thus overcame the dislike for botany which he had expressed when a student. In 1776 he published the first important English flora written in the English language, the previous descriptions of British plants by Johnson and Ray having been in Latin.

Withering moved to Birmingham about this time, where he became a physician to the newly founded general hospital. He was succeeded at Stafford by Thomas Fowler of Fowler's Solution fame, who was a lifelong friend of Withering. In a few years he established a medical practice said to have been one of the largest, if not the largest outside of London. He still found time for botany and mineralogy, to make meteorological observations, and to publish papers and books on botany and on mineralogical subjects. His distinction as a botanist is remembered by the botanical genus, *Witheringia*, while the mineral Witherite commemorates him as a mineralogist. As if this was not enough to occupy his time, he was also a musician, performing on the harpsichord, flute and the bagpipes. He was also a breeder of cattle, and was one of the first to introduce the Jersey cattle from the Channel islands to the mainland of England. Withering's fame, however, really rests upon his discovery of the use of digitalis in medicine. How his attention was first called to it is best told in his own words:

> "In the year 1775 my opinion was asked concerning a family receipt for the cure of the dropsy. I was told that it had long been kept a secret by an old woman in Shropshire who had sometimes made cures after the more regular practitioners had failed. I was informed also that the effects produced were violent vomiting and purging; for the diuretic effects seemed to have been overlooked. The medicine was composed of twenty or more different herbs, but it was not very difficult for one conversant in these subjects to perceive that the active herb could be no other than the Foxglove."

He began to use this remedy in his practice with great success in cases of cardiac dropsy, and in 1785 published "An Account of the Foxglove and Some of Its Medical Uses." Medical men everywhere quickly adopted the use of the drug. It was included in the pharmacopœias of the day, and it has remained in them ever since. Its introduction into use was one of the greatest contributions made by eighteenth century medicine.

Withering used at first a decoction and later an infusion, but finally discarded these for the powdered leaves. He favored the leaves gathered just before blossoming time and removed the midrib. The leaves were then dried in the sun or before a fire. They were then rubbed down "to a beautiful green powder." He gave adults one to three grains of this powder twice a day. He strongly urged against overdosage. Although he regarded digitalis as primarily a diuretic he noted that "it has a power over the motion of the heart to a degree yet unobserved in any other medicine and that this power may be converted to salutary ends." Withering's final conclusions in regard to the uses and effects of digitalis were so sound that our present clinical practice 150 years later (this year is the 150th anniversary of the announcement of Withering's discovery), does not differ materially from his own methods.

If we were to select ten indispensable drugs in the practice of medicine, digitalis, would be one of them. We must not forget that Withering gave us this drug and, furthermore, taught us the clinical use of it, for he was really a great clinician, as well as a great investigator.

Withering suffered from tuberculosis, and in 1793 he published an excellent modern treatment for that disease. He died of tuberculosis in 1799. When dying, one of the most celebrated of puns was uttered by a friend, who remarked that "The Flower of Physicians was now withering." He lies buried in Edgbaston Churchyard, and the foxglove appropriately adorns his monument.

MEDICINE MAKING AS DEPICTED BY MUSEUM DIORAMAS.*

BY CHARLES WHITEBREAD.[1]

Museums do what they can to give publicity to collections of interest to special groups by encouraging staff members to prepare papers for presentation at conventions and for publication in association journals. This is done to make the collections of use to those who do not find it convenient to visit the museum.

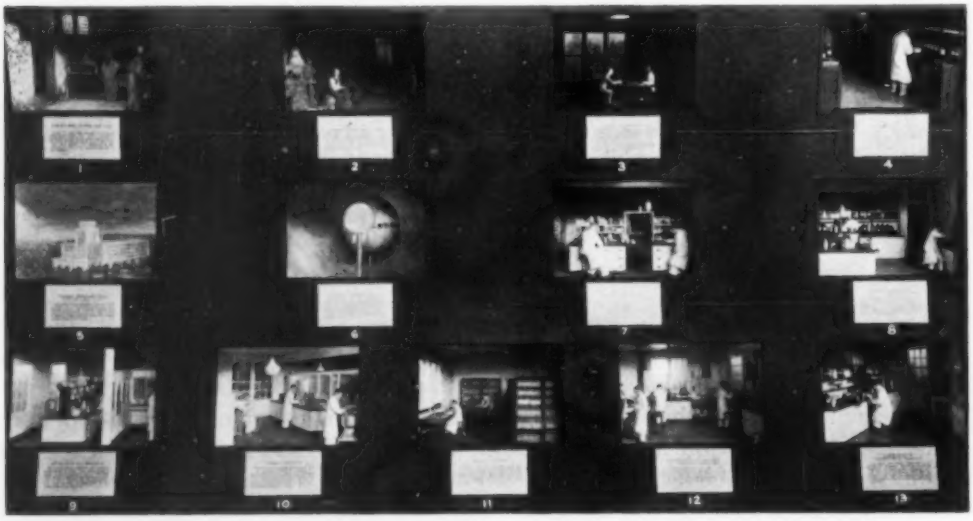

Fig. A.—Dioramas of historical and scientific phases of medicine-making.—*Courtesy of U. S. National Museum.*

The collection of dioramas outlined here illustrates historical and modern phases of medicine making. Pictures of the dioramas are shown, the general labels being lettered and the descriptive legends numbered. These labels and legends were prepared for the laity, but they will be of interest to members of the medical and pharmaceutical professions as well. Reference to the letters and numbers in the following text and illustrations will make it easy to follow the story.

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* Section on Historical Pharmacy, A. PH. A., Portland meeting, 1935.

[1] Assistant Curator, Division of Medicine, U. S. National Museum, Washington, D. C.

A. THE MANUFACTURE OF MEDICINES.

Up to comparatively recent times medicines consisted largely of salves, infusions, powders and decoctions. All of the preparations were crude and those intended to be taken by mouth, nasty in appearance and vile-tasting. There were no standards of uniformity other than a few books of recipes.

With the growth of medical and pharmaceutical knowledge, the ramifications of pharmacy have become so extensive that specialization is imperative. It is no longer practical or possible for one man to undertake, along with the filling of prescriptions and the management of a retail store, the collection of materials from all over the world, and the elaborate processing, assaying, compounding, standardizing, etc., of the great variety of things required by the medical profession. These later phases of pharmacy have been separated from the rest and given over to organizations especially equipped for the purpose—pharmaceutical manufacturers.

The following scenes show how medicine making has progressed, and give glimpses of a typical pharmaceutical manufacturing plant to indicate the hundreds of specialized operators and operations that are required and the careful laboratory testing that is necessary to make the medicines of the present day.

1. A Monastery Apothecary Shop.
(17th century.)

In the 17th and 18th centuries apothecaries were shopkeepers who collected medicinal herbs and chemicals and prescribed them for the sick. During the Dark Ages apothecaries were often monks who ministered to the physical as well as the spiritual ailments of their patients.

2. A Pharmaceutical Laboratory.
(19th century.)

In the early 19th century pharmacy began to emerge as a science separate from medicine. The apothecary, then called a pharmacist, devoted his time to collecting and compounding medicines, while the physician became a specialist in caring for the sick.

3. Doctor and Detail Man.

Pharmaceutical manufacturers send trained representatives known as detail men to visit members of the medical profession. These representatives not only furnish information concerning new medicines, but establish personal contacts with physicians thus making it possible to coördinate the findings of the laboratory with clinical needs.

4. A Modern Prescription Pharmacy.

Modern pharmacies are conducted for the benefit of physicians and the public at large. The pharmacist of to-day obtains his medicinal preparations, already prepared and standardized, from pharmaceutical manufacturers. He then compounds and dispenses them in accordance with physicians' prescriptions.

5. Modern Pharmaceutical Manufacturing Plant.

Several thousand medicinal substances are in constant use by the medical profession. The manufacturing plants required to make these are of necessity quite extensive. Every effort is made to have working conditions pleasant and healthful in all respects.

6. A World of Raw Materials.

The materials from which medicinal substances are derived come from the far corners of the earth. Some are animal, some vegetable and some mineral in origin. Many of the newer drugs are obtained as by-products of other industries or are prepared synthetically from other chemicals.

7. Control of Raw Material Purchases.

The identification and assay of raw material are of primary importance in controlling the quality of the finished product. The man at the left is studying a botanical drug to insure its exact uniformity to official requirements. The man at the right is engaged in extracting the alkaloid of another specimen to determine its drug potency.

8. Chemical Control of Various Stages of Manufacture.

This is another control laboratory. In the rear, two chemists are analyzing specimens of products taken at various stages of the manufacturing process. In the foreground, a finished product is being checked for accuracy of formula and also physical characteristics, such as appearance, disintegration, solubility, time, etc.

9. Bacteriological Research.

Microscopic living organisms produce infectious diseases in man. This scene shows a group of bacteriologists at work. Through study of these organisms and their toxic products, in which industrial laboratories participate, much progress has been made against these diseases.

10. Chemical Research.

Here is a view of a chemical laboratory. One of the chemists is altering the structure of a known chemical compound. The discovery of new chemical substances and the synthetic preparation of others known to exist but difficult or expensive to obtain is a field of unlimited possibility for progress.

11. Library Facilities.

Progressive research work involves the frequent publication of observations as well as the necessity for keeping informed concerning the publications of other laboratories. For this purpose, pharmaceutical manufacturers must maintain complete periodical and reference libraries.

12. Pharmaceutical Research and Biological Extraction.

The study of the action of drugs by determining their effects on animal tissues and functions and the isolation and recovery of physiologically active extracts of animal tissue are two highly important divisions of pharmaceutical research.

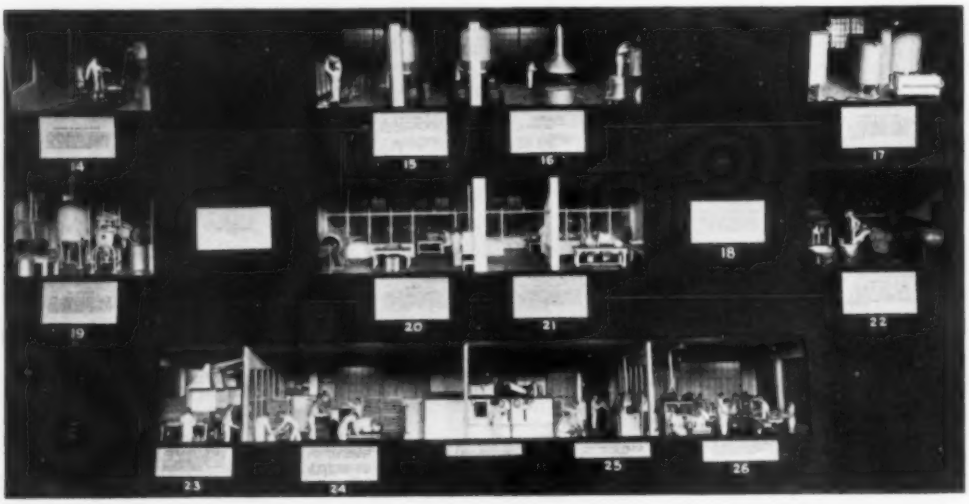

Fig. B.—Industrial scenes in a modern pharmaceutical manufacturing establishment.—*Courtesy of U. S. National Museum.*

13. Laboratory of Experimental Pharmacy.

The above scene shows a laboratory of experimental pharmacy where manufacturing methods are worked out on a laboratory scale, and where such problems as color, taste, appearance and stability are determined for each product before it is given to the plant for actual production.

B. THE MANUFACTURE OF MEDICINES.

Extraction of medicinal substances from drug-bearing leaves, barks, beans and roots may be likened in some respects to the ordinary percolation of coffee. The crude material is first ground or milled, then packed into the percolators while it is moist and allowed to macerate or soak for a while before the percolate containing the extractive is drained off.

The fluid percolate is concentrated by evaporation. In some instances "open evaporation," by merely boiling the fluid is practical. Often, however, heat may destroy or alter the properties of the drug so that it is necessary to concentrate by distilling in a vacuum at low temperature. Powdered extracts are obtained by distilling off all the fluid and drying the residue to a solid form. The extracts obtained in this way may then be standardized and incorporated into the form of the desired product.

Scenes 23 to 26 show how granular effervescent salts are made. An effervescent preparation is obtained by putting a dry acid and a dry carbonate into water simultaneously. The carbon dioxide gas which is liberated produces the effervescence as it bubbles through the water. In order to prepare a granular effervescent salt it is necessary to mix the dry powders, moisten them just enough to allow them to cake slightly and then remove the moisture to check the reaction before an appreciable amount of gas has escaped. With automatic controls and with conditioned air, this may be accomplished with such precision that the resulting product is uniform in chemical composition.

14. Corner of Milling Room.

The balloon-shaped bags over each mill serve to collect and confine the dust from the milling process so that the air is clean and clear at all times. Dust-free air of this kind protects the workers and prevents contamination of the various batches of material being ground.

15. Percolation.

The ground, moistened drug is packed into small percolators. The fluid, or menstruum, used varies with different drugs but usually contains alcohol. The percolate contains the extracted drug. This must be sent to the control laboratory to determine the concentration of the active principle.

16. Evaporation and Vacuum Distillation.

Aqueous extracts are concentrated in steam-jacketed evaporating tanks. Vacuum stills concentrate, at low temperature, percolates containing alcohol or drugs which might deteriorate if subjected to strong heat. The alcohol is recovered and rectified by further distillation.

17. Preparation of Elixirs.

The mixing of ingredients is accomplished by mechanical stirring devices in glass-lined tanks, varying in capacity from 5 to 1000 gallons. Subsequent clarification and filtering is accomplished by mechanically pumping the elixir through a large filter press and back into another tank.

18. Pharmaceutical Manufacturers.

Many great organizations similar to the one depicted in this series of dioramas have been built up to coöperate with modern pharmacists and to supply them with uniform, dependable and standardized therapeutic agents in keeping with the most recent advances in medical science.

19. Emulsification.

Some emulsions can be made with a high speed vacuum mixer, not unlike a large egg beater, operating in a closed tank. With others, however, particularly where it is necessary to break the dispersed phase into particles of colloidal dimensions, colloid mills are used.

20. Ampuls.

Sterile solutions are packaged in sealed glass containers called ampuls. After the solution is placed in ampuls with special asceptic technique and sealed it may again be sterilized by immersing the ampuls in hot water or subjecting them to high temperature produced by steam under pressure.

21. Sterile Solutions.

Solutions of drugs which are to be injected into the tissues or into the blood stream, must be prepared with great exactness to keep them free from contamination with foreign materials. Each solution is passed through a porcelain filter to remove all bacteria without exposing the product to the air.

22. Ointments

Ointments are made by stirring the desired medicinal ingredients into the correct mixture of melted greases, fats and waxes. After cooling, a mixture of this kind returns to a semi-solid consistency and is then milled with special equipment such as that shown in the center of the room.

23. Granular Effervescent Salts.

The ingredients of a granular effervescent salt are weighed and mixed in an air-conditioned room. Two operators check each weight to guard against error. The mixers are operated a sufficient length of time to obtain a thoroughly uniform mixture. Each mixture is assayed to insure uniformity.

24. Granular Effervescent Salts.

The dry mixture is spread on trays and subjected to an atmosphere of extreme humidity. This is done in the cabinet at the rear. The moist granules are then screened, placed back on the trays and passed into drying tunnels where the atmosphere is again automatically controlled.

25 and 26. Granular Effervescent Salts.

The dry granules as they emerge from the tunnel are removed from the trays, again screened and collected in hoppers. The hoppers are used to load the filling machines from which the filled bottles pass on a continuous belt to the capping, labeling and cartoning machines in succession.

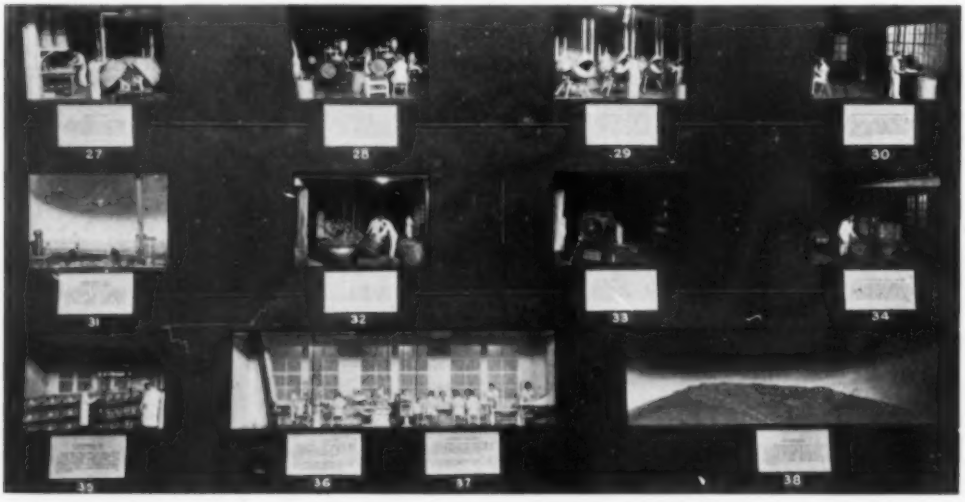

Fig. C.—A continuation of the industrial scenes, the final dioramas dealing with standardization, finishing, packaging and distributing.—*Courtesy of U. S. National Museum.*

C. THE MANUFACTURE OF MEDICINES.

One of the earliest improvements in oral medication was the development of the use of pills as a method of giving medicine in concentrated form. By swallowing a whole pill the patient was able to avoid its bad taste. The earliest type was the so-called mass pill made by moistening powders with a sticky substance and rolling them into pills while they are of a doughy consistency. The invention of a method of coating the pills with sugar was a further refinement in the interest of taste.

The next forward step was the development of the friable pill process in which the pills are made in large revolving tubs by gradually adding the powdered mixture to a previously counted number of starters without the use of a sticky excipient. In this process the pills gradually build themselves up like a snowball by adherence of the moist powder to the starters as the tubs revolve. With a sugar coating this form of pill presents the advantages of the older type plus the additional advantages of friability and greater accuracy of dosage. The next advance was the development and refinement of the process for compressing tablets. It is now possible to punch powders into tablets by machine with an accuracy equal to that obtained in friable pills and at less cost.

The problem of dispensing to retailers is a complicated one. For each product thought must be given to the type of package which is most suitable not only from the standpoint of convenience, cost and appearance, but also with respect to stability after it leaves the plant. Moreover, each package of each manufactured lot must bear its individual lot number. This makes it possible to trace the entire manufacturing history of any single bottle of medicine on the market at any time.

27. Friable Pills.

An operator is shown pouring the powders slowly onto the starters in the revolving tubs, moistening the mixture at the same time. When the pills have attained the desired size as measured in the sizer which is shown at the left, they are dried in ovens before being coated.

28. Compressed Tablets.

Powdered drug mixtures are converted into minute granules by moistening, drying and screening. They are then punched into tablets by rotary compressing machines. The operator checks the weight of the tablets for each machine at 15-minute intervals to be sure that the punches retain their correct adjustment.

29. Coating of Pills and Tablets.

Pills or tablets are coated by being rolled in sugar syrup in revolving tubs. Color coatings are applied in the same way. After the coatings are applied a sample of each lot is sent to the Control Laboratory for chemical assay, and for testing disintegration and solubility time.

30. Filling Hard Gelatin Capsules.

Special filling equipment designed to fill empty gelatin capsules with an exact weight of powder renders this form of medication available for those who desire it. This type of filling is carried out in conditioned air, and the capsules are put into bottles and sealed before leaving the room.

31. Fishing for Cod—Lofoten, Norway.

From the livers of cod fish are obtained the growth-promoting vitamin A and the antirachitic vitamin D. At certain seasons the fish migrate to the coasts of Norway and Newfoundland. Codfishing is largely confined to these areas and to only a few weeks each year.

32. Extraction of Cod Liver Oil.

The finest quality of cod liver oil can be obtained only when the livers are removed from the fish as soon as possible after they are caught, and the oil is extracted at once in vacuum equipment to preserve the vitamin content and prevent the development of rancidity.

33. Removal of Cod Liver Oil Stearin.

The stearin is removed from cod liver oil so that the oil will not thicken or solidify when kept in a refrigerator. To do this, the oil is chilled and the solidified stearin removed by pressure filtration. The by-product, cod liver stearin, is used in the manufacture of soap.

34. Cod Liver Oil in Steel Drums.

The destearinated oil is then graded according to its vitamin potency in preparation for shipment. It is placed in air-tight steel drums under carbon dioxide gas to prevent deterioration by contact with air en route, and is transported to the United States by steamship.

35. Standardization of Cod Liver Oil.

On arrival in this country the higher grades of oil are again assayed and standardized on the basis of natural vitamin content. The potency with respect to vitamins A and D is accurately determined by biological standardization using albino rats and checked by chemical methods.

36. Filling Bottles.

Washed bottles are brought to the filling machines by conveyors. As they are filled carbon dioxide gas is forced into them to displace the air and protect the product. The filled bottles are inspected through magnifying glasses as they pass along the conveyor belt to the capping machines.

37. Finishing Bottles.

A moving belt carries the sealed bottles to the labeling machines where a label is put on each bottle, after which the bottles are cartoned in single packages and larger lots. The packages are put into shipping containers and conveyed directly to the warehouse to await shipment.

38. Distribution.

The completed product is shipped to branch warehouses conveniently located at central points in the various sections of the country. From these, wholesalers in the principal cities and retailers in every corner of the country may be served promptly with supplies to fill their needs.

This splendid collection of dioramas was contributed to the Museum by The Upjohn Company, Kalamazoo, Michigan. The subjects to be illustrated were chosen by Dr. E. Gifford Upjohn and those who worked with him. Most of the dioramas are actual scenes of the Upjohn offices and laboratories. The Diorama Corporation of America, Chicago, Illinois, made the dioramas.

Much credit is due The Upjohn Company for its public spiritedness in presenting in such an impressive manner some of the professional and scientific aspects of medicine making—the art of the pharmacist.

This collection of dioramas has been on exhibition since November 1934, and has elicited much favorable comment. It is hoped that members of the association will take the time to inspect this exhibit when they visit the city of Washington.

UNDERGRADUATE RESEARCH.*

BY LAWRENCE H. BALDINGER.[1]

Undergraduate research, as referred to in this paper, includes that work of an investigative nature, curricular or extra-curricular, assigned to students working for a bachelor's degree. This topic is undoubtedly of more interest to those engaged in the teaching of pharmacy than to those engaged in commercial pursuits. Individuals in the latter group, however, can do much by assisting in this work and by realizing the possibilities of the intelligent application of undergraduate research in developing the scientific and professional attitude of our student pharmacists. Ira Remsen once wrote (1): "There is nothing mysterious about research. Every human being, in fact every animal, is by nature engaged in research, that is to say, trying to find out something about its environment." Research, fundamental or industrial, undergraduate or graduate, is one of the best means of acquiring new information, of developing in the student the qualities of originality, accuracy, reliability, a regard for professional ethics and a respect for hard work and properly directed imagination.

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* Section on Education and Legislation, Portland meeting, 1935.

[1] Department of Pharmacy, University of Notre Dame, Notre Dame, Indiana.

If, by means of well-planned and directed problems in undergraduate research, we can develop to a small degree in our students these qualities so necessary for a professional point of view, the profession of pharmacy will be benefited in so far as these are put to practice.

A hasty survey of the catalogs from sixty-three pharmacy schools reveals the following facts: Seven schools state specifically that a thesis in pharmacy or in a related field must be submitted before graduation, and two of these seven give credit to the student for this work; fifteen schools offer research as an elective course in the senior year, the credit given being based upon the amount of work done; two schools offer research but give no credit for the work. In a number of schools instructors assign small problems as part of the regular class work. No mention is made of this work in the catalogs, hence it is difficult to approximate the prevalence of this practice. In many cases, however, the same result is achieved as if the student was assigned a thesis problem which would require the major part of a school year for completion. Research work toward higher degrees is mentioned in catalogs from some of the remaining schools in the list. This data, however, was disregarded because we were concerned only with research offered to or required of undergraduates.

A number of objections have been voiced by pharmaceutical educators toward undergraduate research. While some are unquestionably well founded and worthy of consideration, others can hardly be considered in keeping with good pedagogy and high academic standards. Some say that the curriculum for the four-year course will not permit sufficient time to complete a thesis. Others say that the time spent in writing a thesis could be better utilized by taking extra course work. Cost is considered by some as an obstacle while others confess a lack of subjects for assignment to students. The most frequently voiced objection states that the undergraduate is incapable of doing acceptable research and that the time would be wasted.

The choice of a thesis depends upon the student's likes and dislikes, and upon his qualifications for the work. The latter, obviously, should be considered carefully by the instructor in charge of the research. An important factor, too often overlooked, is the assignment of a problem within the scope of the student's training, a problem which will not be too comprehensive so as to discourage the young researcher. The beginner should be impressed that every new fact, however small or circumscribed, is worth while and that, in the beginning of his career, he should be satisfied with problems dealing with some definite, specific and concrete point, even if it is a small one, and that it is far better to complete a small bit of research than to overtax his limitations on a problem too comprehensive.

Three types of theses may be offered to undergraduate students. The first type is known commonly as a library thesis. In this work the student may trace the history of a law, a preparation or a method of treatment. Obviously, extensive library facilities are necessary for this type of research as well as for the bibliographical thesis in which the student collects bibliographical references for one particular problem without writing a summary of the work which he has done.

For those students who prefer laboratory work and in those cases where library facilities are limited, a simple problem involving laboratory work as well as

some literature research is most desirable. Here again the director of research must exercise good judgment in selecting and assigning a problem which he knows will culminate with a fair degree of success, a problem which, no matter how small, will give the student a sense of satisfaction in a task well done.

In the two types of theses mentioned thus far a knowledge of scientific literature is not only desirable but imperative. Too many students are being graduated from universities with a hazy idea of what constitutes a good scientific journal, and a still hazier idea of how to go about using a library, either scientific or general. If, in completing a simple thesis, the student does nothing more than to learn how to use *Chemical Abstracts*, the proper method of listing and abbreviating journal references, and to acquire a speaking knowledge of standard reference texts and methods, his work has been well worth while and he has profited by the experience.

The third type of thesis is suggested for those students whose interests are mainly commercial and who expect to enter the business world. A laboratory or library thesis will not appeal to this type of student and it is far better to assign a problem involving survey work in a drug store or one having a commercial interest. In this type of thesis the enthusiastic help and coöperation of the pharmacists in the vicinity of the school are paramount, hence the request, early in this paper, that this group be cognizant of the possibilities of this work. If properly handled, it may result in a closer affiliation between the pharmacists and the school.

As has been stated, the qualifications of the student determine to a great extent the type of thesis assigned, the amount of time to be allotted, and the complexity of the problem. While some juniors are sufficiently mature to begin the work, it seems to be common experience that the first three-quarters of the senior year are best adapted to the work. A student soon learns to budget his time in order to do the maximum amount of work in the shortest time.

To instil into the student the true research spirit, the director must set the example. One can hardly expect the student to show enthusiasm over a problem which is assigned with a glad-that-is-over attitude on the part of the instructor. To familiarize the student with the proper use of the library, the instructor should be thoroughly acquainted with the library facilities in his own institution, neighboring institutions and cities. In this connection it might be well for the reader to review the paper, "The Use of the Library in Undergraduate Instruction" by Lee (2). John C. Merriam (3) has stated four reasons why a university or college includes constructive work as a necessary part of its regular program. Two of the four reasons are as follows:

> "(*a*) Investigation is an indispensable means of keeping the faculty in a position to present the most fundamental and most advanced knowledge through its teaching.
>
> "(*b*) Training in creative or constructive work is one of the most important phases of teaching and can be carried out successfully only through actual experience of the student."

It is obvious that research on the part of the instructor is necessary not only for personal intellectual growth but also for assuming the leadership of those under him.

In attempting a brief summary, only a few of the advantages of undergraduate research can be listed. It teaches the student how to use scientific literature and

how to organize material which he has collected from laboratory experiments and from library research; it develops a sense of responsibility, serves as an apprenticeship for those who plan to enter graduate work and, most important of all, it engenders a scientific attitude so necessary in the development of a professional point of view.

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DENTAL PROFESSION MEETS IN NEW YORK.

BY GEORGE C. SCHICKS.*

Dentistry holds, yearly, at least three conventions of national importance, that of the American Dental Association and the meetings held annually in New York and Chicago.

The Greater New York December Meeting of the First and Second District Dental Societies was held in the Hotel Pennsylvania the first week in December. It was the eleventh annual session and was very well attended by dentists and those in allied professions from all parts of the United States, from Canada and South America.

The program for the New York Meeting is always interesting; it was especially so this year.

Dentists have a characteristic way of offering what might be called specialized graduate courses of instruction to their members in the form of clinics. Each clinic is scheduled for three days and two hours each day is devoted to them. The duration of each class is one hour, though some have two-hour sessions, therefore six different classes may be met by each lecturer during the three days. Clinicians usually give one lecture to the general assembly during the week in addition to meeting the regular classes. Members of the dental profession may attend the clinics on payment of five dollars. It is surprising and pleasing to note the number of dentists who, each year, eagerly await the opportunity to register for such instruction.

The dentists had a wide choice of subjects to choose from in the 23 clinics available. Many of them were of particular interest to the pharmacist as well as to the dentist. Those having more or less specific application to the profession of pharmacy were:

1. Root Surgery Fundamentals Essential to Success, Clinician U. G. Rickert, Professor of Therapeutics and Materia Medica, University of Michigan, and also a member of the Council on Dental Therapeutics.
2. Surgical Treatment of Pyorrhea, Clinician Theodore O. Peterson, Past-President, Second District Dental Society.
3. Pre-Operative and Post-Operative Treatment, Clinician C. Raymond Wells, Chief of Dental Service, Queens General Hospitals, New York.
4. Root Amputation for the General Practitioner, Clinician E. Blumenthal, Director Dental Department, Greenpoint Hospital, Chief of Dental Department, Beth Moses Hospital, Brooklyn, New York.
5. Medication, How and What to Prescribe, Clinician George C. Schicks, Assistant Dean and Professor of Materia Medica, Rutgers University, College of Pharmacy

One morning was given to the combined Medical and Dental discussion of the Report of the Sub-Committee on the Study of Curricula of Medical and Dental Schools in the United States and Canada. The Report was presented by M. O. Magid, M.D., and discussed alternately

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by medical and dental practitioners. The Committee urged a better understanding between the two professions. A list of subjects was mentioned with the suggestion that they be taught in the Medical and Dental Colleges so that each would have a better knowledge of fundamental and special sciences applicable to each profession. In part, the medical men thought that the dentist should receive more instruction in anatomy, pathology, physiology, bacteriology, hygiene and physical diagnosis as it pertains to the practice of the physician. The dentists suggested that the physician should be better trained in maxilliodental surgery, dental infection and its relation to diseases elsewhere in the body, oral diagnosis, etc. It was brought out that out of all the Medical Colleges not more than fourteen made any reference to stomatology in their curricula. Hospital interneship is not required of the dentist graduating from College at the present time. The report recommended that the dentist be required to have hospital experience so that he is better equipped to enter the practice of his profession. Dental Colleges have recently had a study made of their curricula by the Carnegie Survey Committee.

One evening was devoted to Topic Discussions. A list of subjects such as Preventive Dentistry, Nutrition and Diet, Operative Dentistry, Porcelain Restorations, and many others were scheduled as "Clinic Sessions without Clinics." Each topic is assigned to a Leader, who answers a set of printed questions outlined in the general program and asked of the Leader by the chairman of the session. Those attending the discussions are also permitted to ask questions, thus affording the dentist an opportunity to obtain information on the problem with which he is individually concerned.

Commercial houses occupied considerable space with their exhibits. It is interesting and gratifying that there are fewer displays of those products not approved by the Council on Dental Therapeutics.

There is much that those interested in Pharmacy can learn by attending dental conventions. There is a real opportunity for the ethical pharmacist to acquaint himself with the uses dentists have for medication. The pharmacist who is a specialist in his profession will find the dentist willing to go more than half way to do his part in rendering a service with the pharmacist which will aid in advancing public health.

COMMITTEE REPORTS

REPORT OF THE COMMITTEE FOR THE COLLECTION OF INFORMATION PERTAINING TO PROFESSIONAL PHARMACY.

BY MARVIN J. ANDREWS, *Chairman*.

The Committee for the Collection of Information Pertaining to Professional Pharmacy was appointed by Chairman Henry M. Burlage in accordance with a recommendation passed by the Section on Practical Pharmacy and Dispensing at the 1934 meeting held in Washington, D. C.

As implied by the name, the duty of this Committee was to contact (1) Deans of all Schools of Pharmacy, (2) Secretaries of State, City and County Pharmaceutical Associations and (3) Hospital Pharmacies in an effort to collect any information that may be used to promote the best interests of Professional Pharmacy. With this in view it was thought best for the Chairman of the Committee to assume the responsibility of contacting the first two groups, but due to the size of the third group, namely, Hospital Pharmacies, each member of the Committee should assume the responsibility of contacting the hospitals located in the States, assigned to them.

With this in view the members of the Committee were assigned to contact the hospitals located in the following States.

Marvin J. Andrews	Delaware, District of Columbia, Maryland, New Jersey and Pennsylvania.
Ralph W. Clark[1]	Iowa, Kansas, Missouri and Wisconsin.
W. G. Crockett	Kentucky, Ohio, Virginia and West Virginia.
Richard D. Franklin	Connecticut, Massachusetts and Rhode Island.

[1] Officers of Section and ex-officio members of the Committee.

Elmer L. Hammond	Alabama, Arkansas, Louisiana, Mississippi, Oklahoma and Texas.
J. Solon Mordell	Maine, New Hampshire, New York and Vermont.
Emery T. Motley	Florida, Georgia, North Carolina, South Carolina and Tennessee.
Charles V. Netz	Minnesota, Nebraska, North Dakota and South Dakota.
Leon W. Richards[1]	Colorado, Montana and Wyoming.
L. Wait Rising[1]	Idaho, New Mexico, Utah and Washington.
E. T. Stuhr	Arizona, California, Nevada and Oregon.
Ralph E. Terry	Indiana, Illinois and Michigan.

As it is impossible to give a detailed report of all the information collected, the Committee has decided to summarize all the questionnaires and make a brief general report under each division.

INFORMATION OBTAINED FROM SCHOOLS OF PHARMACY.

In addition to training students in Chemistry, Pharmacognosy, Pharmacology, Pharmacy, etc., which is the primary purpose of all Schools of Pharmacy, the questionnaires from 49 Pharmacy Schools revealed that some also take an active part in many other fields which are best summarized as follows:

1. Scientific articles are written pertaining to some phase of Pharmacy which are presented before National, State, County and City Pharmaceutical Associations. A great many of these are published in some Pharmaceutical Journal.
2. Research is carried on by members of the various faculties in many different fields of Pharmacy.
3. Some schools or members of their faculty take an active part in the revision of the U. S. P. and N. F.
4. An active part is taken in National and State Pharmaceutical Associations through which State Laws and regulations for pharmacy have been constantly improved in the last decade.
5. Give lectures in Pharmacy to (*a*) Medical Students, (*b*) Hospital Interns.
6. Conduct pharmacies located in hospitals.
7. Prepare U. S. P. and N. F. displays at State or National Medical, Dental or Hospital Association meetings.
8. Send out U. S. P. and N. F. Publicity Bulletins or Pamphlets in conjunction with local or State Pharmaceutical Associations.
9. Have Student Pharmaceutical Association meetings and conduct an open house night at least once a year.
10. Conduct or aid in preparing the programs for the Scientific Section of State Pharmaceutical Associations.
11. Aid Retail Pharmacists by (*a*) acting as consultants in prescription and dispensing problems, (*b*) loaning apparatus and preparing professional pharmacy window displays, (*c*) assisting pharmacists in planning their detailing material for the medical and dental professions and also for the laymen.

There are no doubt a great many other activities in which Schools of Pharmacy participate but the above data is confined to the actual information obtained from the questionnaires received.

INFORMATION OBTAINED FROM STATE PHARMACEUTICAL ASSOCIATION SECRETARIES.

The questionnaire sent to the State Pharmaceutical Association Secretaries asks for a great amount of information as to the activities of the State, County and City Associations pertaining to the promotion of the best interest of Professional Pharmacy. The four main questions requested are as follows: (1) Does Association have a Committee for promoting Professional Pharmacy? (2) Name of the Committee. (3) Who is Chairman of this Committee? Address of Chairman and (4) What type of work is this Committee doing?

At the present time your Committee has had replies from 35 State Secretaries, of which only 13 States have an active Committee to promote the use of U. S. P. and N. F. Products or to contact members of the Medical, Dental or Hospital Associations. Due to the elements of time and expense the Committee has not as yet contacted the County and City Associations listed on the

[1] Officers of Section and ex-officio members of the Committee.

questionnaires, but will do so next year if it is the desire of the Section and the AMERICAN PHARMACEUTICAL ASSOCIATION.

A summary of the activities of the Committees in the States of Illinois, Indiana, Iowa, Maryland, Minnesota, Mississippi, Oregon, New Jersey, New York, Ohio, Pennsylvania, South Dakota and Wisconsin as supplied on the questionnaires is as follows:

1. Annual displays of U. S. P. and N. F. drugs and preparations at State Dental, Hospital, Medical or Pharmaceutical Association meetings.

2. Sponsor joint meetings between Dentists, Pharmacists and Physicians.

3. Prescriptions containing U. S. P. and N. F. Products are sent to members of the Dental or Medical Associations in one of the following ways: (*a*) Advertisements in Medical Journals, (*b*) Booklets such as those used in New York, New Jersey and Pennsylvania, (*c*) On 3" x 5" index cards such as those used in Minnesota and (*d*) Bulletins printed on the letterhead of the Committee as used in Maryland, etc.

In a great many of the above-mentioned States the pharmacists receive copies of the prescriptions through their State Journals before they are mailed to members of the other professions.

The questionnaires from Kansas, Montana, New Hampshire, North Carolina and Rhode Island indicate that these States have appointed or intend to appoint Committees to contact members of professions other than Pharmacy.

In addition to the above information a great many State Pharmaceutical Associations are devoting one day of their annual meeting to scientific work for the first time in 1935.

INFORMATION OBTAINED FROM HOSPITALS.

The Committee contacted the larger hospitals in the United States in an effort to collect Hospital Formularies as well as to obtain other data. In addition to obtaining the name, address and size of the hospital the following information was requested on the questionnaire: (1) Does hospital have an outpatient dispensary? (2) Does hospital have its own hospital formulary? (3) Does hospital have special names for combinations used in the dispensary or throughout hospital? (4) Number of registered pharmacists employed in hospital. (5) Name and address of Chief Pharmacist. (6) Name and address of all other pharmacists. (7) Have any papers been written by members of the Pharmacy Staff? (8) Give author's name and cite bibliographical information: *i. e.*, title of work, name of periodical, also year and page reference.

To date replies have been received from 381 hospitals, 99 of which sent formularies, and 24 stated that their formularies were undergoing revision and when complete a copy would be forwarded. The remaining 258 hospitals returned the questionnaires filled out with the notation that the hospital did not have a formulary, or that the U. S. P. and N. F. were used exclusively.

The formularies varied from a few handwritten prescriptions to elaborate mimeographed or printed books. The prescription combinations contained in the formularies were to be prescribed by one of the following methods: (1) by numbers, (2) by special names, or (3) to be written out in the form of a prescription.

As the space in the JOURNAL and the time for the presentation of this report is limited it will be impossible to give a great deal of specific information which would necessarily be required to summarize the remaining vast amount of information collected by the Committee. However, it may be well to include a few of the outstanding points, that are quite evident upon examining the questionnaires and formularies which were sent to your Committee, that may aid other hospital pharmacists in revising their hospital formularies, etc., in the future.

The constructive criticisms may be briefly summarized as follows:

1. A great many of the present formularies are in need of revision as some were printed as far back as 1911 and naturally contain a great many obsolete drugs and prescriptions.

2. A definite policy should be established before the prescriptions are written for incorporation in the formularies so that the young physician (Intern) may have a guide that is reasonably correct from a pharmaceutical standpoint. The most frequent mistakes found in the formularies collected are: (*a*) The ingredients in the same prescription are written in Latin, Abbreviated Latin, English or a combination of any or all of the above-mentioned instead of using one definite language throughout. (*b*) The quantities of the ingredients are written in either the Avoirdupois, Apothecary or Metric System. In some instances two different systems are used in the same prescription, that is, the quantity of the first ingredient is given in grains, the second in grams, etc.

We suggest that the quantities of the ingredients be written in the Apothecary System and the conversions into the Metric System be placed to the right in a corresponding column. The following will act as an illustration.

Ingredients Used in Prescription.	Amt. in Each Dose.		Amt. Usually Prescribed.	
	Apoth.	Metric.	Apoth.	Metric.

(*c*) There is a continual use of the abbreviation for the Avoirdupois ounce (oz. which equals 437.5 grains) when the abbreviation for the Apothecary ounce (Apoth. oz. or ℥ which equals 480 grains) is desired. Likewise the symbol oz. is used when it should be fl. oz. or fl. ℥.

3. The galley or page proof of the formulary should be thoroughly proof-read by several qualified pharmacists. Some of the formularies received contain any number of mistakes in spelling the names of drugs as well as conversions of quantities. The general arrangement of the prescriptions, etc., indicate the author or authors know very little or nothing about pharmacy.

The above criticism is given with the view of constructive rather than destructive information in the revision of hospital formularies. A great number of the formularies received by the Committee have been carefully prepared and will accomplish much in the promotion of the best interests of professional pharmacy.

RECOMMENDATIONS MADE BY MEMBERS OF THE COMMITTEE.

1. This Section in coöperation with the Section on Education and Legislation or the ASSOCIATION should foster a vigorous program to find out wherein the education of pharmacists is lax in respect to the attainment of professional ideals, thereby endeavoring to uplift the dignity of pharmacy as a profession.

2. The Section or the ASSOCIATION should make a survey as to the number of hospitals employing registered pharmacists as compared with those that employ none.

3. The ASSOCIATION should endeavor to enlist the many hospital pharmacists in this country to join the AMERICAN PHARMACEUTICAL ASSOCIATION as these men are the first to actually contact the young physicians after they graduate.

4. The Section or the ASSOCIATION should encourage hospital pharmacists to conduct dignified, scientific laboratories offering every assistance in the way of consultation, research, etc., instead of conducting just a "Pill Dispensing" storeroom.

5. The ASSOCIATION should endeavor to correlate and supply authoritative information that will be of aid to local and state associations in promoting the use of official products.

6. The Section should request the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION to appropriate $100.00 to be used in purchasing letter size folders and State guides for filing all information collected by the Committee during 1934–1935 and to continue the work during 1935–1936. This information is to be placed in the AMERICAN INSTITUTE OF PHARMACY.

In conclusion, I would like to take this opportunity to thank the members of this Committee and all others that have worked with me during the past year in collecting the information pertaining to professional pharmacy.

PHILADELPHIA STUDENT BRANCH A. PH. A. PROPOSED.

In the last few weeks there has been considerable discussion among the Pharmacy students relative to the fact that there is no student organization of Pharmacy Students. Attention to this fact has been brought to the members of the staff. With a Biological Society and a Chemical Society, it would not seem amiss in a college of Pharmacy to have a Pharmaceutical Society.

Other colleges have solved the problem with a student branch of the AMERICAN PHARMACEUTICAL ASSOCIATION. This seems to be the most logical type of organization to further the professional and technical side of Pharmacy. With an organization of this kind in the college, the Pharmacy students will have all the advantages of membership in the AMERICAN PHARMACEUTICAL ASSOCIATION, although not eligible for actual membership until graduation.

Matters of pharmaceutical interest will be discussed at the meetings as well as articles from the JOURNAL. Extra information will also be given to the group from the ASSOCIATION.

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council." —Part of Chapter VI, Article VI of the By-Laws.

ARTICLE III of Chapter VII reads: "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it.* And no local branch shall enact any article of Constitution or By-Law to conflict with the Constitution or By-Laws of this Association."

ARTICLE IV of Chapter VII reads: "Each local branch having not less than 50 dues-paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates."

Reports of the meeting of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten with wide spaces between the lines. Care should be taken to give proper names correctly and manuscript should be signed by the reporter. *Please advise us of changes in Roster and mail reports promptly.*

CHICAGO.

The monthly meeting of the Chicago Branch of the A. PH. A. was held Tuesday evening, December 10th, at the University of Illinois, College of Pharmacy.

President S. W. Morrison appointed the following nominating committee for officers of the coming year: W. B. Day, *Chairman;* I. A. Becker, C. F. Lanwermeyer.

A resolution of condolence was passed to Mrs. Fred W. Meissner, whose late husband was one of the oldest members of the Branch.

The speaker of the evening was Dr. Julius Hess, president of the Chicago Medical Society, who spoke on "The Value of Serum Therapy."

According to Dr. Hess, serums are thought of mainly as to curative value, but in reality, are active for only a few months.

Emphasis was placed on the fact that one should always prepare for an anaphylactic shock when using serums where they have been used before. From his own experiences Dr. Hess has a fear of repeated antitoxins.

Slides were shown giving statistical data of the deaths in Chicago from the year 1833 to 1930, due to diseases. Important steps in curtailment of these diseases were also listed. A decided advance in preventative medicine was noticed by the decline in deaths from diphtheria, smallpox, malaria, tuberculosis, typhoid and infantile paralysis.

The antitoxins were discussed individually in the following order:

Diphtheria.—The danger is in not diagnosing the case early enough and in not giving enough antitoxin. In advanced cases the antitoxin should be given intravenously. Large, early doses are advised.

Tetanus.—Those cases that develop in eight to ten days are difficult to treat. In prophylaxis treatment Dr. Hess recommends that in these cases the regular dose of 1500 units be increased to many times that amount. If the original wound is reopened at any time it is recommended that a fresh injection of the antitoxin be given. The curative dose depends upon the virulence of the organism and the resistance of the patient.

In recent work at the Cook County Hospital the patients have first been given 50 mg. per Kg. of body weight of Avertan, rectally. Spinal punctures are no longer given as this upsets the patient. It was suggested that the antitoxin be given intravenously in 60,000 to 200,000 units.

Erysipelas.—This is a streptococcus disease and at one time played terrific havoc with new born babies and mothers. As made to-day it is both antitoxic and antibacterial in action. It usually takes repeated doses to cure; convalescence serum is an aid in treatment. In severest cases and if other serums have failed massive transfusions of the blood of recently recovered patients should be used.

Scarlet Fever.—This is also a streptococcus disease. The question arises of prophylaxis in the presence of the disease. The incubation period of the disease is from five to eight days.

If a horse serum is used the patient is sensitized; it is suggested that large curative doses be given as this sensitizes no more than a small dose. The safest way to minimize contacts is to give the blood of those who have had scarlet fever. For prevention the Dick vaccine can be given. At first many patients were found who did not remain immune, but larger doses are given now and Dr. Hess practices and recommends its use.

Meningitis.—This treatment should be given intraspinally. Where extra-spinal symptoms are outstanding the injection should be made intramuscularly. In the opinion of Dr. Hess the first dose should be given partly in the spine and partly in the vein.

The following serums were discussed in order:

Antipneumococcus Serum.—There is still much to learn of pneumonia. A study is now being made of human convalescent serum and two cases of children were mentioned as now convalescing after this treatment. One child was of the No. 3 type and the other was No. 4 type. 200 cc. of the serum were injected.

Antidysentery Serum.—Use is made of this serum and results have been obtained in some cases.

Poliomyelitis Serum.—Dr. Hess believes that human convalescence serum has a place in the treatment of this disease. A case was cited where a boy's life was saved by the injection of 240 cc. of it. Cases should be absolutely isolated.

Measles.—This common disease is now 90% preventative. Placental extract is now being used more or less as an experiment. Human convalescent serum is not practical as it is hard to get measles blood as blood is not drawn from children as a rule.

Chicken Pox.—We have only human convalescent serum for treatment.

Mumps.—Mumps can be checked and modified with 5 cc. of human convalescent serum. In the early stages larger doses of the serum will modify after the disease has developed.

Pertussis.—Vaccination is recommended against pertussis. The vaccination must be given at least six weeks before exposure. There have been some very good results. Some 600 children were given the vaccinations wherein only three cases developed. It is questionable how long the immunization will last.

The meeting was closed by an open discussion with remarks of particular importance by Dr. Fantus and O. U. Sisson.

L. TEMPLETON, *Secretary-Treasurer.*

NEW YORK.

By invitation of the Kings County Pharmaceutical Society, the December 9, 1935, meeting of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held in the Brooklyn College of Pharmacy, Long Island University. About seventy-five members and their guests attended.

The meeting was called to order by President Ballard who thanked the Brooklyn College of Pharmacy for the opportunity of assembling in their building. The minutes of the previous meeting were read and approved. The report of Treasurer Currens was submitted.

Chairman Lehman, of Committee on Education and Legislation, then reported as follows:

National Legislation.—Of foremost interest to the pharmaceutical profession, before the next session of Congress are the following bills: Robinson-Patman Anti-price Discrimination Bill, H.R.8442; Robinson-Tydings National Fair Trade enabling act; Copeland (Tugwell) Bill, Food and Drug Reform.

The first makes it unlawful for any person engaged in commerce to discriminate in price or terms between purchasers of commodities of like grade and quality, to prohibit the payment of brokerage or commission under certain conditions, to suppress pseudo-advertising allowances, to provide a presumptive measure of damages in certain cases, and to protect the independent merchant, the public whom he serves, the manufacturer from whom he buys, from exploitation by unfair competitors, etc.

The second permits price standardization by amending the Federal Trade law, Section 1, as follows: Provided that nothing herein contained shall render illegal, contracts or agreements prescribing the minimum prices for the sale or resale of a commodity which bears the trade-

mark, brand or the name of the producer or owner of such commodity and which is in fair competition with commodities of the same general class produced by others when such contracts or agreements are lawful under any statute now or hereafter in effect in any state, territory or the District of Columbia in which such sale or resale is to be made, and the making of such contracts or agreements shall not be an unfair method of competition under Section 45, Title 15, U. S. C.

The Copeland Food and Drugs bill will be pushed forward vigorously it is reported.

The Federal Trade Commission has approved a rule prohibiting sales below cost "with the intent and with the effect of injuring a competitor where the effect may be to substantially lessen competition or tend to create a monopoly or to unreasonably restrain trade, cost being determined by including all elements recognized by good accounting practices."

Under the New York State Fair Trade Law, the following suits were tried:

Cooper and Cooper *vs.* Angert, temporary injunction granted.
Doubleday, Doran Co. *vs.* Macy, temporary injunction denied.
Coty *vs.* Hearns Dept. Stores, temporary injunction denied.
Seeck & Kade Co. *vs.* Tomschinsky, temporary injunction denied.

The first case tried before Judge Brennan in Brooklyn, the second and fourth by Judge Close in White Plains, the third case before Judge Roseman in New York City.

Appeals are being argued in Albany, at present, on the three last ones and a decision is hoped for in January.

There is also a case of Retailer against Retailer, under Section two of the act: Harry Dolen *vs.* Salzman & Bromberg, of which there is no report up to this time.

The Fair Trade Committee asks the member of the pharmaceutical profession to reserve judgment and not worry unnecessarily about the outcome of the matter.

About 125 deputy inspectors were appointed by the New York State Board of Pharmacy under the appropriation granted by the Federal Government, and these men and women are doing effective work in remedying abuses in illegal and sub-standard sales in non-pharmaceutical stores.

I have before me a letter from the New York State Pharmacist enclosing a galley proof of an article showing that the pharmacist must pay the following number of taxes. New York City taxes, 8, State Taxes, 7 and Federal Taxes, 12. However, the *Bulletin* of the California State Association lists not less than 52 (fifty-two) Federal taxes, and what is good for the Golden State must be good in the Empire State.

F. C. A. Schaefer, Branch Delegate to the New York Pharmaceutical Council submitted the following report: Another mass meeting is to be held on the evening of December 10, at 9:30 P.M., in the Hotel Pennsylvania, the object being to further the application of the new Fair Trade Act. Steps are being taken to organize Manhattan pharmaceutically as has so successfully been done in other Boroughs of the city.

Chairman Steiger, of Progress of Pharmacy Committee, reported as follows:

Two interesting articles on Unsaturated Fatty Acids appear in *Drug Trade News* for Nov. 25th. The first quotes Dr. August J. Pocini of the Pharmaceutical Specialties Co. He claims that linoleic and linolenic acids are effective in preventing head-colds, because head-colds start as a hay-fever like allergic condition, which can be treated by the use of these acids. Pocini points to several years of research by many workers, including Oncken, Burrs, Hansen and Corubleet, tracing the effects of unsaturated fatty acids in various allergic conditions, to the final conclusion that head-colds may be prevented by restoration to the diet of the unsaturated fatty acids that industry has removed.

The second article refers to the researches of Dr. F. E. Chidester. His claim is that the unsaturated fatty acids, in combination with traces of organic iodine, constitute a powerful tool in the hands of medicine, for the cure and prevention of a large number of diseases due to glandular unbalance. "Dr. Chidester's finding that the unsaturated fatty acids are a valuable factor in the control of the common cold is but a special limited application of a much broader theory which involves the interaction and interdependence of all the vitamins, the iodine-fat balance of the human metabolism, the thyroid secretion and human nutrition in general."

A patent granted to G. B. Walden, assigned to Eli Lilly & Co., describes the production of a highly effective concentrated anti-anemic substance from stomach tissue.

Pharmacy in Germany, as recently reorganized, is reported by the *Pharmazeutische Zeitung*, which prints the long list of professional regulations which strictly govern the conduct of German pharmacies. A few of the regulations follow:

No. 1. The Pharmacy is an institution of the State Public Health Service. Its task consists in service for the public welfare. Striving after profit must take second place to the achievement of this purpose. (Regulations Nos. 2 to 5 are familiar ethical standards.)

No. 6. Methods are forbidden which have as their object the capture of business in an unfair manner. Particular instances of such methods are: (These are numerous and are numbered alphabetically. I will quote only a few.)

f. Fraudulent claims that the pharmacy has a privileged position.

g. The use of misleading terms in describing or recommending medicaments, for instance, "the only genuine," "only to be had at Blank's," etc.

m. Arrangements with doctors or other persons who treat sickness whereby medicaments are ordered under brand names and descriptions which prevent their being compounded by any other pharmacist.

n. Supplying drugs to persons for purpose of door-to-door selling.

No. 7. Breaches of these regulations will be dealt with by professional tribunals.

Under the heading of Communications a letter from Chairman A. Ziefle, of A. PH. A. Committee on Local Branches, was read. This letter called upon the local branches to communicate their ideas and suggestions for improving and strengthening the local branches. The resolution submitted by the N. Y. Branch at the Portland Convention was quoted in part. The matter was discussed but no action was taken. Dr. Schaefer pointed out that a meeting of the A. PH. A. Council had taken place on December 6th, and it would be advisable to find out what action had been taken on the N. Y. Branch resolution.

President Ballard appointed the following to membership on the Nominating Committee to report at the next meeting: Peter Conroy, Lewis N. Brown, Robert S. Lehman, *Chairman*.

The chairman then introduced the speaker for the evening, Dr. Albert F. R. Andresen, who discussed, "The Fallacies of Symptomatic Treatment in Gastro-Intestinal Diseases."

The speaker referred to some of the essentials of the anatomy and physiology of the gastro intestinal tract. This was important for a clear understanding of the discussion which followed. Dr. Andresen was careful to make clear that substances within the gastro intestinal tract were not within the body but in a canal or tube which went through the body.

He explained that the stomach is one of the most abused organs. Many irritating substances find their way to the stomach and greater care should be given to avoiding excessively hot or cold foods.

Dr. Andresen enumerated some of the common symptoms observed by people suffering with various disorders of the gastro intestinal tract. He stated that frequently the "home treatment" used, was the cause of serious damage due to the fact that the symptoms had been misinterpreted. The speaker was particularly careful to point out that abdominal pains did not always indicate a stomach or intestinal disorder, but were frequently the result of a ruptured appendix, gall-stones, or even coronary thrombosis.

The layman does not realize the dangers of home treatment when he employs cathartics and enemas in cases where vomiting, cramps and perhaps constipation occurs. Many such instances have turned out to be caused by an intestinal obstruction and quick surgical action was necessary to save the patient's life.

Gastric ulcer was then discussed and the speaker said that this was a condition which was very much overtreated to-day. Regulation of diet was all that was needed, medication being wholly unnecessary.

A point which few people realize is that diarrhrea is far more serious than constipation. In all cases the cause of diarrhrea should be determined, since it is frequently a symptom of infectious disease. Cancer of the bowel causes diarrhrea, and the speaker mentioned that this was one of the most easily treated types of cancer, particularly in early states.

In conclusion Dr. Andresen explained that all the symptoms of gastro intestinal disorder

might be caused by allergy. It is, therefore, important to determine the cause of the symptom and we should not trust ourselves to ordinary home remedies.

A discussion followed in which the speaker and Messrs. Seley, Milliman, Maistelman, Ballard, Schroeder and Schaefer took part. In the discussion the following additional points were brought out.

Stomach ulcers form rather quickly, often in 2 to 4 hours. Food, especially that containing large residue, along with water, constitutes the safest and best laxative.

The taking of bran and other "roughage" can be carried to a point of producing actual harm by "packing" the bowel.

Some persons are sensitive to phenolphthalein, and it is an irritant in any event.

When a laxative is needed constantly, change should be resorted to, it is then best to experiment with different laxatives.

Psyllium seed in excess can do harm by causing impaction.

Smoking of tobacco can cause symptoms of stomach or intestinal disorder by allergic reactions.

Following the discussion Dr. Ballard thanked the speaker and a rising vote of thanks was given the speaker.

RUDOLF O. HAUCK, *Secretary.*

(See Philadelphia, page 53; Northern Ohio Branch will appear in February JOURNAL.)

ASSOCIATION BUSINESS

AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1935–1936.

Office of the Secretary, 2215 Constitution Ave., Washington, D. C.

LETTER NO. 11.

January 13, 1936.

To the Members of the Council:

74. Minutes of the Meeting of the Council on December 5, 1935. Comments were received from two members. Dr. Swain approved the minutes as submitted. Dr. Fischelis requested three changes which have been made in pages 27, 28 and 29. Corrected copies are sent herewith and the members are requested to substitute them for the pages bearing the same numbers, in Council Letter No. 10.

(*Motion No. 32*) It is moved by Eberle that the minutes of the meetings of the Council on December 5, 1935, as given in Letter No. 10 and as corrected, be approved.

75. Bequest of Dr. Frederick B. Kilmer. See Items 70, Letter No. 12; 75 in Letter No. 14, and 115, in Letter No. 22, 1934–1935. The following letter has been received from Charles M. Morris, Counselor at Law, New Brunswick, N. J.:

"I represent the Executors of the Estate of Frederick B. Kilmer, late of New Brunswick, deceased.

"The Executors desire to pay the bequest of $3000.00 under the terms of the Will, and I herewith enclose a release, which I would thank you to have executed and returned to me; upon receipt of the release properly executed, I will forward check for $3000.00 in payment of the bequest."

The release is as follows:

"Know all men by these presents, that whereas Frederick B. Kilmer, late of the City of New Brunswick, in the County of Middlesex, and State of New Jersey, deceased, in and by his last Will and Testament duly proved before the Surrogate of the County of Middlesex, did give and bequeath as follows:

"I give and bequeath unto the AMERICAN PHARMACEUTICAL ASSOCIATION, organized under the District of Columbia, the sum of Three Thousand Dollars, to be held in trust, the income to be applied to the awarding of a prize for meritorious work in pharmacognosy, such prize to be known

as 'The Kilmer Prize,' or an equivalent designation. In awarding the prize preference to be given to studies in vegetable drugs. The recipient of the prize shall be a graduate in pharmacy. Teachers in colleges of pharmacy, workers in pharmaceutical laboratories, are to be excluded from competing for the prize. Prize to be awarded under such conditions as the ASSOCIATION may elect. Funds arising from the income which may not be used are to be added to the amount of the prize or added to the principal, as the ASSOCIATION may elect."

and in and by said Will and Testament did nominate and appoint Josephine I. Dooley and Lewis Sceva Executors thereof.

Now therefore, the said AMERICAN PHARMACEUTICAL ASSOCIATION does hereby acknowledge that it has received from the said Josephine I. Dooley and Lewis Sceva, Executors as aforesaid, the sum of Three Thousand Dollars ($3000.00) in full for the legacy to it bequeathed in and by the last Will of the said Frederick B. Kilmer, as aforesaid, and by these presents does for itself, its successors, remise, release and forever discharge the said Josephine I. Dooley and Lewis Sceva, Executors as aforesaid, their heirs, executors and administrators, of and from all claims and demands whatsoever in law or in equity which against the said Josephine I. Dooley and Lewis Sceva, or against the said Estate of Frederick B. Kilmer, deceased, it has or shall have by reason of the aforesaid legacy.

In witness whereof, the said AMERICAN PHARMACEUTICAL ASSOCIATION has caused these presents to be signed by its duly authorized officers and its corporate seal to be hereto affixed this day of Nineteen Hundred Thirty-Five.

AMERICAN PHARMACEUTICAL ASSOCIATION.
By:.....

ATTEST:

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(*Motion No. 33*) It is moved by Philip that the secretary be and is hereby authorized to execute the release requested by the executors of the Will of the late Dr. Frederick B. Kilmer, and that the treasurer be authorized to deposit the check for $3000.00 in a permanent fund to be known as the F. B. Kilmer Fund.

A vote is called for at this time but will be considered as tentative if there is comment or objection.

76. Proposed Publication. In accordance with Motion No. 20 (see Council Letter No. 10, page 1110), Chairman Hilton has appointed the following special committees:

Committee on Contents, Scope and Style.—R. L. Swain, *Chairman*, A. G. DuMez, R. P. Fischelis, H. V. Arny and F. A. Delgado.

Committee on Ways and Means.—C. W. Holton, *Chairman*, H. A. B. Dunning, W. D. Adams, W. B. Philip and J. Lester Hayman.

77. Contract for Printing and Mailing the Journal for 1936. In accordance with the motion adopted by the Council (see Council Letter No. 10, page 1110), bids were obtained from the firms that have in recent years been invited to bid. After a careful study of the bids as submitted, Chairman DuMez recommends that the contract with the Mack Printing Company be renewed for 1936 on the basis of the contract for 1935, and Editor Eberle concurs in this recommendation.

(*Motion No. 34*) It is moved by DuMez that the contract for printing and mailing the JOURNAL for 1936 be awarded to the Mack Printing Company of Easton, Pa. At the request of Chairman DuMez a vote is called for at this time but will be considered as tentative if there is objection.

78. Budget for 1936. Chairman Philip of the Committee on Finance submits, in accordance with Article II of the By-Laws of the Council, the following report on appropriations and expenditures for 1935 with a proposed budget of receipts and appropriations for 1936 which were prepared by the secretary and approved by the Committee on Finance.

An addition was made to the appropriations for General Expenses in 1935—$20.00 for the Committee on Horticultural Nomenclature. Of the appropriations for General Expenses, three were exceeded to December 1st:

The disbursements for Telegraph and Telephone were $217.03 against $200.00.

The disbursements for Office Supplies were $161.46 against $150.00.

The disbursements for Traveling Expenses were $602.24 against $500.00.

The first two are within the $50.00 limit for which no Council action is required; the latter is due to the travel incidental to national legislation. The disbursements for General Expenses to December 1st totaled $15,084.33 against $23,050.00 appropriated.

Under the appropriations for Open Accounts, the disbursements to December 1st were as follows:

The disbursements for the JOURNAL were $5228.48 against $11,000.00.

The disbursements for the N. F. were $3876.26 against $1000.00.

The disbursements for the R. B. were $680.27 against $500.00.

The disbursements for Badges and Bars, no disbursement against $50.00.

To December 1st the total disbursements for General Expenses and for Open Accounts were $24,869.39 against $35,600.00 and the budget will not be exceeded although some heavy payments will be made in December, since a considerable proportion of the annual income is received in that month.

The receipts to December 1st vary considerably from the receipts for the same period in 1934:

From Dues, $7592.88 against $7369.48. Bills for dues for 1936 were mailed on December 1st and it is impossible to estimate the total for the year, although the increase so far is encouraging.

From the JOURNAL, $6958.37 against $8529.85. A payment made early in December which should have been received in November would have brought the total to about $7900.00.

From the National Formulary, $1624.74 against $2737.27.

From the Recipe Book, $425.34 against $1228.32.

From the YEAR BOOK, $3144.74 of which $2000.00 was billed in December 1934, and was due for that year.

It was necessary to use the income from the Life Membership Fund and to transfer $2000.00 of the accumulated interest to the Current Fund.

It is hoped that the arrangement recently made for budgeting the expenses of the N. F. revision and the completion of the YEAR BOOK series in 1936 will make it possible to again balance the annual budget.

In submitting the following estimate of receipts during 1936, only a part of the expected receipts from the N. F. and R. B. are given as it is the desire of the Committee to budget the receipts more equally over the ten-year period. No doubt the total receipts from these publications will be materially larger than the estimates. The following is suggested:

Dues	$13,000.00
Interest, Life Membership Fund	1,100.00
JOURNAL	9,500.00
National Formulary	17,500.00
Recipe Book	3,000.00
YEAR BOOK and Abstracts	1,200.00
Total	$45,300.00

It will be recalled that during 1935, Volume 22 of the YEAR BOOK was issued and that the Pharmaceutical Abstracts for 1935 were published monthly in the JOURNAL. Volume 23 of the YEAR BOOK, which is the last of the series, will be issued in 1936 and the Pharmaceutical Abstracts for 1936 will be carried in the JOURNAL. It is, therefore, necessary to include in the Budget for General Expenses, $3500.00 for the YEAR BOOK and also to increase the appropriation for the JOURNAL in the budget for Open Accounts, from $11,000.00 to $15,000.00 to cover the expenses of the Abstracts. This double charge will not be necessary after 1936. The appropriations for the N. F. and R. B. in the following proposed budget have been increased to take care of the revision expenses.

APPROPRIATIONS FOR GENERAL EXPENSES.

No. 1	Salaries	$11,700.00
No. 2	Maintenance of Building	3,500.00
No. 3	Telegraph and Telephone	200.00
No. 4	Clerical Expenses	1,200.00

No. 5	Printing, Postage and Stationery	700.00	
No. 6	Office Supplies	150.00	
No. 7	Traveling Expenses	750.00	
No. 8	Premium on Bonds	50.00	
No. 9	Auditing	75.00	
No. 10	Certificates	50.00	
No. 11	Miscellaneous	200.00	
No. 12	Scientific Section	25.00	
No. 13	Section on Education and Legislation	25.00	
No. 14	Section on Practical Pharmacy and Dispensing	25.00	
No. 15	Section on Commercial Interests	25.00	
No. 16	Section on Historical Pharmacy	25.00	
No. 17	Committee on Proprietary Medicine	100.00	
No. 18	Committee on Local Branches	25.00	
No. 19	Committee on Membership	500.00	
No. 20	Committee on State and National Legislation	50.00	
No. 21	Committee on Syllabus	50.00	
No. 22	Committee on Pharmacy Week	500.00	
No. 23	Inter-Society Color Council	25.00	
No. 24	Committee on Emblem	50.00	
No. 25	International Pharmaceutical Federation	120.00	
No. 26	Metric Association	10.00	
No. 27	American Council on Pharmaceutical Education	200.00	
No. 28	YEAR BOOK	3,500.00	
No. 29	Library	50.00	$23,880.00

APPROPRIATIONS FOR OPEN ACCOUNTS.

No. 30	JOURNAL		
	(*a*) Publication	$ 9,300.00	
	(*b*) Clerical Expense	1,200.00	
	(*c*) Postage and Stationery	300.00	
	(*d*) Freight, Drayage and Miscellaneous	200.00	
	(*e*) Abstracts	4,000.00	
		$15,000.00	
No. 31	National Formulary		
	(*a*) Clerical Expenses	$1,100.00	
	(*b*) Bulletins	500.00	
	(*c*) Supplies and Miscellaneous	200.00	
	(*d*) Chairman's Traveling Expenses	400.00	
	(*e*) Publicity and Exhibits	300.00	
	(*f*) Investigation, Revision	2,500.00	
		$5,000.00	
No. 32	Recipe Book	$ 750.00	
No. 33	Badges and Bars	50.00	$20,800.00
			$44,680.00

It will be noted that the appropriations for Traveling Expenses and for the Committees on Proprietary Medicines, on Membership and on Pharmacy Week have been increased and that $50.00 is added to the budget for the special Committee on Emblem at the request of its Chairman, George D. Beal. Although the receipts will probably be higher than the estimates, it will be necessary to continue to curtail expenses wherever possible in order to conserve the balance for later years when receipts will be less.

Later, it will probably be necessary to make additions to the budget to extend present activities and to cover the new activities which have been proposed and are under consideration.

(*Motion No. 35*) It is moved by Philip that the budget for 1936 be approved as submitted. With the approval of the chairman of the Council a vote is called for at this time. It will be considered as tentative if there is objection.

79. Selection of Auditors. The chairman of the Committee on Finance recommends the employment of W. A. Johnson & Co., Baltimore, Md., to audit the accounts of the ASSOCIATION for 1935, in accordance with Article VIII of Chapter IV of the By-Laws. This Company has audited the accounts since 1922. The appropriation for the audit has been $75.00 for each year.

(*Motion No. 36*) It is moved by Philip that W. A. Johnson & Co. be employed to audit the accounts of the ASSOCIATION for 1935.

80. Applicants for Membership. The following applications properly endorsed and accompanied by the first year's dues have been received:

No. 135, Russel John Fosbinder, 250 High St., Newark, N. J.; No. 136, Richard Henry Gerkensmeyer, 1345 Washtenaw Ave., Ann Arbor, Mich.; No. 137, George Alfred Clapesattle, 1130 Neil Ave., Columbus, Ohio; No. 138, Thomas W. Bishop, 2804 N.E. 36th Ave., Portland, Ore.; No. 139, Geo. Lloyd Bunting, 32nd & Falls Cliff Rd., Baltimore, Md.; No. 140, Homer John Welty, 3520 Fulton St., San Francisco, Calif.; No. 141, Abdul Fattah Mallah, American University, Beirut, Syria; No. 142, Harold Beach, 701 Lake St., Topeka, Kans.; No. 143, Albert M. Slaght, 80 Wheeler St., West Orange, N. J.; No. 144, Edward W. Jackson, 200 Ballantine Parkway, Newark, N. J.; No. 145, Louis F. Bishop, 1172 Park Ave., New York, N. Y.; No. 146, Louis F. Bishop, Jr., 121 E. 60th St., New York, N. Y.; No. 147, Vreeland Tompkins, 572 Communipaw Ave., Jersey City, N. J.; No. 148, Nat Kessler, 9 Clinton St., Newark, N. J.; No. 149, Robert C. Clothier, Rutgers University, New Brunswick, N. J.; No. 150, Charles T. Root, C.C.C. Camp Stronge, Stronge, Mich.; No. 151, Ralph Henry Auch, 3449 Custer Ave., Cincinnati, Ohio; No. 152, Amos Ludwig Kroupa, University Hospital, Ann Arbor, Mich.; No. 153, Harold M. Herrin, Winder, Ga.; No. 154, J. L. Hawk, 1176 Peachtree St., Atlanta, Ga.; No. 155, R. M. Mitchell, Griffin, Ga.; No. 156, R. C. Coleman, State Capitol, Atlanta, Ga.; No. 157, Walter L. West, Sandersville, Ga.; No. 158, A. A. Evanson, Fargo Clinic, Fargo, N. D.; No. 159, Lyle Reimers, Stanley, N. Dak.; N. 160, A. E. Erickson, 641—1 Ave., N., Fargo, N. Dak.; No. 161, Charles Tuffiash, 37 No. Munn Ave., Newark, N. J.; No. 162, Abram Mosler, 268 Main St., Orange, N. J.; No. 163, Wm. G. Mennen, 345 Central Ave., Newark, N. J.; No. 164, Frank G. Abbott, 345 Central Ave., Newark, N. J.; No. 165, Walter Dennis Griffin, Jr., Pi Delta Sigma House, Gainesville, Fla.; No. 166, Herbert Mitchell Webb, P. O. Box 2148, Gainesville, Fla.; No. 167, C. Howard Lapouraille, 1435 Orleans St., Baltimore, Md.; No. 168, Reba Malin, Box 68, Glendale, Calif.; No. 169, Robert Clayton Pursell, Rivervale Rd., Park Ridge, N. J.; No. 170, J. Jampolsky, 2, King George Ave., Jerusalem, Palestine; No. 171, Louis Thomas Bragassa, Jr., 1516 Thomas St., Gainesville, Fla.; No. 172, Morris Schneider, 1111 W. Masonic St., Gainesville, Fla.; No. 173, Ernest R. Zuick, 1226 Rialto Ave., San Bernardino, Calif.

(*Motion No. 37*) Vote on applications for membership in the AMERICAN PHARMACEUTICAL ASSOCIATION.

E. F. KELLY, *Secretary.*

ARMY MEDICAL LIBRARY.

The Army Medical Library, Washington, has received a gift of rare books from Dr. Ernest Cushing Richardson, emeritus director of the Princeton University Library and consultant in bibliography and research of the Library of Congress. The Library is enriched by approximately 3000 rare publications of the eighteenth and nineteenth centuries, acquired in Europe some years ago by Dr. Richardson.

The chief item of the collection is a set of nearly 2000 items on mineral waters, collected by the former superintendent of public health of Bassano, Italy. Material of this kind is now extremely rare and difficult to obtain through the regular book channels. Among other rare medical books included in the gift is one on human anatomy, published in Naples in 1718 by Philippus Verheyen.

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C. B. JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A. A. C. P., EDITOR OF THIS DEPARTMENT.

Some may question the wisdom of a College of Pharmacy offering courses that involve food analysis on the assumption that Agriculture and Home Economic Colleges should give such courses. Professor Glover makes it clear why Colleges of Pharmacy are especially fitted to prepare analysts for state and federal laboratories and for control laboratories. All persons interested in such a course in food and drug analysis will find Professor Glover's paper worth perusing as it contains many valuable suggestions regarding the teaching of such a course.—C. B. JORDAN, *Editor*.

TEACHING OF FOOD AND DRUG ANALYSIS.

BY. C. C. GLOVER.*

Soon after the enactment of the Pure Food and Drug Act in 1906 it became apparent that men and women training for positions in state, federal and municipal laboratories maintained as a necessary part of the enforcement machinery should have something more than a straight chemical preparation. Agricultural colleges were able to supply chemists equipped to handle the food work and colleges of pharmacy could meet the demand for drug analysts, but the ideal combination of training in both food and drug analysis in the same school was hard to get. Since agricultural colleges were not equipped to furnish the necessary training about drugs, it was only natural that some colleges of pharmacy should undertake to supply the demand by adding food analysis to the pharmaceutical curriculum which already included an adequate chemical background.

The Food and Drug Act at once adopted the U. S. P. and N. F. tests for identity and purity and assay procedure, but methods for food analysis and control had to be developed through the medium of the Association of Agricultural Chemists. Analytical procedures for food control have been developed and perfected and official methods of food analysis are published in book form under the title of "Official and Tentative Methods of Analysis."

The food and drug chemist must not only be a competent analyst but must further be capable of presenting evidence in court. Some knowledge of court procedure is therefore highly desirable. With these requirements in mind the training of the food and drug chemist should include not only laboratory exercises to familiarize the student with the various analytical procedures necessary to check the identity, quality and purity of various foods, beverages, confectionery and condiments, but also interpretation of analytical results should be discussed and library reference reading assigned in order to acquaint the student with the literature in this special field.

Experience has shown that most of the fundamentals in a laboratory course in food analysis may be covered in a single semester of three or four hours' credit, leaving a second semester of two or three additional hours for more advanced study.

* Professor of Pharmacognosy, University of Michigan.

It is here assumed that students are not ready to take up a course in food analysis until they have had qualitative and quantitative analysis and organic chemistry. Too often, in order to save time in laboratory courses, most of the reagents and volumetric solutions are prepared for the students, but we believe that the preparation of some of these solutions and reagents have a decided instructional value and will tend to give the worker greater confidence when later entering a control laboratory.

Laboratory exercises should be carefully selected to include the use of all the special apparatus and instruments commonly employed in the up-to-date laboratory. The skill and accuracy of each student may be developed and checked at will by preparing unknowns for analysis whose composition is known to the instructor and the results reported may be graded not only according to accuracy, but also upon the speed of the worker. For one student may promptly report the correct result of an analysis while another may require double the time or may spoil the unknown and require a refill two or three times before completing the analysis.

Report blanks may be provided in printed forms which have space for analytical data and the interpretation of results by the analyst.

In order to impress the laboratory worker with the necessity for care in handling expensive laboratory equipment, students may be requested to prepare a list of all special apparatus required in a modern analytical laboratory and to estimate the cost of equipment after consulting apparatus catalogs.

Nearly a third of the lecture or class-room periods may well be devoted to the working of mathematical problems based upon laboratory data, for too often a student, after completing a quantitative laboratory experiment, is unable to complete the necessary calculations or may not know the reasons why if able to follow detailed instructions.

The importance of alcohol determinations seems to justify the analysis of two or more beverages both for per cent of alcohol and denaturants. This exercise includes work with the immersion refractometer and Geissler pycnometer.

The detection of artificial food colors may be presented by giving each student at least five solutions and two or more colored candies.

A vinegar analysis involves a variety of tests both qualitative and quantitative and requires the use of the polariscope. Likewise, vanilla extract analysis provides opportunity for use of the colorimeter and the tintometer.

Although modern sterilization processes in canning would seem to make the use of chemical preservatives unnecessary, nevertheless, such products as catsup have been found on the market containing a liberal amount of sodium fluoride and hamburg steak and other ground meats are too often loaded with sulphites.

In the opinion of the writer work on butter and milk had best be preceded by a study of salad oils and fats and usually these three last mentioned items are best placed at the end of the course because of their complexity. Laboratory work with this group brings into use the Abbé Refractometer, Westphal Balance, viscosimeter, lactometer, Babcock apparatus and many others.

To a course of four hours may be added baking powder analysis involving gasometric apparatus, work on spices and condiments, and spore and mold counting in tomato products. The determination of spray residues from the use of insecticides

offers an interesting field and one which is steadily growing in importance to the health of our nation.

In conclusion, while recognizing the importance of developing skill in laboratory technique, we believe that too much emphasis cannot be laid upon the importance of reference reading and habitual contact with current literature.

As a necessary stimulus to that end we have found it very effective to prepare lists of questions on each subject covered in the laboratory outline which the student is required to answer in writing and hand in to the instructor. Such written reports not only serve to direct the student in his reading but also supply the instructor with another check upon the diligence and comprehension of each student.

MINIMUM STANDARDS FOR A HOSPITAL PHARMACY.*

BY EDWARD SPEASE[1] AND ROBERT M. PORTER.[2]

It goes without saying that any one person who attempts to outline these standards will be governed entirely by his own experiences and observations. It is our belief that the necessity for pharmaceutical service in hospitals is now so generally accepted that it is unnecessary to discuss it in this paper.

It would appear that the thing most needed at the present time is the development of a set of principles which can govern those whose duty it is to inspect and approve hospitals. Hospitals are of so many different types and serve such a variety of purposes that, if we should make the attempt to set forth a detailed list of standards, equipment and procedures, we should only provoke endless and futile discussions and so it would seem wise to leave the details which in time will become necessary to be decided in a more orderly manner.

We might offer as a suggested method that a committee chosen from each of the existing hospital associations with the inspecting organization's representative as arbiter would very quickly settle all details.

We have already submitted five principles to Dr. MacEachern of the American College of Surgeons and receiving no adverse criticism of them we shall again present them here with some explanation of them attached.

PRINCIPLE NO. 1.

Every hospital must have pharmaceutical service.

(*a*) The full time of a graduate registered pharmacist, or

(*b*) Pharmaceutical service from an approved adjacent pharmacy.

Under the heading (*a*) there will be some opposition to the use of the word, "graduate." We have given this subject much thought and inasmuch as these are principles to guide an inspecting officer and are not statute law it would seem to us wise to retain this word. No organization working for the good of hospitals would insist upon the removal of a pharmacist because he or she is not a college graduate if the service can be satisfactory, but if due consideration is to be given to the safety of the patient and if necessary service and coöperation is to be offered to the physician, it appears that all replacements and all new pharmacists added should be graduates of recognized colleges of pharmacy.

Under the heading (*b*) there are no standards for an approved pharmacy but as the AMERICAN PHARMACEUTICAL ASSOCIATION is now considering such standards it would appear that their

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* Presented at the Clinical Congress of the American College of Surgeons, Hospital Standardization Conference, San Francisco, October 28–November 1, 1935.

[1] Dean of the School of Pharmacy, Western Reserve University and Directing Pharmacist of the University Hospitals of Cleveland.

[2] Instructor in Pharmacy, School of Pharmacy, Western Reserve University and Pharmacist of the University Hospitals of Cleveland.

steps will be hastened if they should observe that hospitals and medical associations may find it necessary to have such standards promulgated.

It may be of interest to mention that the New York pharmacy laws now prescribe a minimum list of equipment for a registered pharmacy. If this list be chosen as a working basis only, a few items would have to be added for pharmaceutical service to small hospitals.

PRINCIPLE NO. 2.

> A pharmacy committee shall be appointed, the members of which shall be chosen from the several divisions of the medical staff, for the purpose of determining the policy of operation of the pharmacy, addition to and deletion from the drugs used, such other matters of a pharmaceutical nature as from time to time are necessary, and supervision of purchase and issuance of drugs, chemicals, pharmaceutical preparations, biologicals and professional supplies within the hospital. This committee shall meet at regular intervals. The Pharmacist shall be a member of it and serve as its secretary, and a transcript of its proceedings shall be kept and a copy forwarded by the secretary to the proper governing body of the hospital.

For clarity of discussion we are listing, briefly, what Principle No. 2 contains:

(*a*) Establishment of a Pharmacy Committee and its duties.

(*b*) Supervision by this committee of the purchase and issuance of drugs, chemicals, pharmaceutical preparations, biologicals and professional supplies.

(*a*) The establishment of a Pharmacy Committee, which, in our Hospitals, is composed of the Associate Professors of Medicine, Surgery, Pediatrics, Gynecology and Obstetrics, a Clinical Instructor in Medicine, the Dean of the School of Pharmacy and the Chief Pharmacist, has been the most important step taken to insure proper pharmaceutical service. In many hospitals the Committee may not need to be so large but surely both medicine and surgery as well as pharmacy should be represented and also any other department that is particularly accented by that hospital. What we are seeking to avoid is the appointment of one medical man to supervise the pharmacy. Our service requires the knowledge of men who represent or are thoroughly conversant with all the main services of the hospital and are men of the type and standing who can carry back decisions to staff members and have these decisions respected. These committee members can also call upon staff and visiting members for information upon and support for projects being considered by the committee. It might not be amiss for this committee to have a voice in the approval of the qualifications of the pharmacist. We, as a committee, do not issue orders, but rather we work on the policy of "ask the man who uses it" and then when our report goes to the administration for an executive order it is often merely a matter of form. This is particularly and peculiarly true of professional supplies. In this field, to which little systematized study has been given, such a committee will work wonders in terms of both satisfaction and economy.

(*b*) Supervision by the Committee of all purchase and issuance of pharmaceutical and professional supplies items does not mean the act of purchase. This may be left to a clerk or administrative officer but the committee, through its pharmacist, should be clothed with authority not only for obtaining proper items but also for rejecting improper ones. All new items should receive committee approval, not necessarily for trial, but before they become items of stock.

PRINCIPLE NO. 3.

> An adequate pharmaceutical reference library must be maintained by the hospital.
>
> (*a*) United States Pharmacopœia, National Formulary, New and Nonofficial Remedies, United States Dispensatory, reference works on Inorganic, Organic and Quantitative Chemistry, Pharmacology, Toxicology, Bacteriology and a medical dictionary.
>
> (*b*) The *Journal of the American Medical Association*, the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, the YEAR BOOK of the AMERICAN PHARMACEUTICAL ASSOCIATION, the federal regulations relative to the dispensing

of alcohol and narcotics and a copy of the state and municipal pharmacy laws and sanitary code.

Here the attempt has been made to list a bare minimum of reference works. The good pharmacist must be familiar with these reference works and indeed his field of reading must be far wider if he is to furnish adequate service to physicians, nursing service and administration.

PRINCIPLE NO. 4.

Every hospital must use drugs, chemicals and pharmaceutical preparations of at least United States Pharmacopœia, National Formulary and New and Non-official Remedies quality in the treatment of patients.

Comment upon this section should be unnecessary but the inclusion of it is very necessary for the good of the patient. Price is the least important factor in judging the fitness of these things.

PRINCIPLE NO. 5.

The routine preparation of injectible medication and supervision of sterilization of all preparations he himself prepares, the routine manufacture of pharmaceuticals, the dispensing of drugs, chemicals and pharmaceutical preparations, the filling and labeling of all drug containers issued to nursing units from which medication is to be administered, a semi-monthly inspection of all pharmaceutical supplies on nursing units, the maintenance of an approved stock of antidotes in the emergency suite, the dispensing of all narcotic drugs and a perpetual inventory of them, specifications for purchase of all drugs, chemicals and pharmaceutical preparations used in the treatment of patients, specifications for purchase and storage of biologicals and all operations wherein a special knowledge of pharmacy, including a ready knowledge of weights and measures in all systems, is necessary, must be done by the pharmacist or under his immediate supervision.

In commenting upon this principle we shall divide it into its several topics.

(*a*) Preparation of injectible medication and its subsequent sterilization. This is a true function of the pharmacy and of the pharmacist. This work is now in the hands of cheap labor, technicians, nurses, pharmacists and physicians. Sterilization in hospitals is being given careful study in many places now. Nothing has been definitely settled nor have definite standards been worked out, though much has been accomplished. The whole subject is of such vast importance that we firmly believe it should be under the supervision of one person who is particularly fitted to understand its ramifications and who is scientifically trained so that he knows what he is doing and for whom it is a major duty and responsibility and not an incidental one.

(*b*) The routine manufacture of pharmaceuticals.

(*c*) The dispensing of drugs, chemicals and pharmaceutical preparations.

(*d*) The filling and labeling of all drug containers from which medication is to be administered.

(*b*), (*c*) and (*d*) certainly go to the pharmacist without question, yet there are many questions upon these subjects which come up regularly for committee judgment. In this connection let us point out the dangers involved in nurse and lay dispensing of drugs to personnel and to patients upon their discharge from the hospital. An entire chapter could be written upon these dangerous practices.

(*e*) Inspection of drug supplies on nursing units is not alone a check upon the nurse. That phase of it is a small part of the importance of the inspection. Our nursing service welcomes this inspection and the placing of the responsibility for drugs upon the pharmacist where it belongs, and even sends a nursing instructor along with the pharmacist upon these inspection trips.

The following items of this principle are so self evident that prolonged discussion of them seems unnecessary.

PRINCIPLE NO. 6.

This has been left blank for a perfectly self-evident purpose, that is, inability at present to state it in definite, clear and concise language, though we believe it

will be easy to make a brief statement that will serve as a basis for future elaboration. This principle should cover the "ethical and commercial aspect of the pharmacy" and the things it should deal in, other than those mentioned and hinted at in the first five principles. It should decide who may purchase from the pharmacy, upon what basis and what charges are to be made.

In drafting this principle the whole question of employee purchases, staff purchases and direct sales to the public must come up for consideration. We believe that if we could have the benefit of your discussion upon this very troublesome list of subjects we could at least outline something that would serve as a beginning. May we venture to assert that we believe you all will be opposed to direct sales to the public by a hospital pharmacy. If you agree on this point then the others may be tentatively settled by requiring a set and stated policy by each hospital so that an inspecting officer may see clearly what is being done and judge for himself whether it constitutes ethical practice. This will result finally in the setting forth of a sound Principle No. 6 under which all can work.

Before closing we wish to add what we in the University Hospitals of Cleveland call our Drug Policy. We soon learned that our committee could not function properly without such a policy and it may serve a useful purpose to each of you.

DRUG POLICY.

Pharmacopœia.

The pharmacy shall stock, or be prepared to supply preparations of the United States Pharmacopœia, National Formulary and New and Nonofficial Remedies. Where New and Nonofficial Remedies lists several articles "having similar composition or action," a selection of such preparations, chosen by the Pharmacy Committee and approved by the Medical Council, shall be carried. This is necessary because of the expense involved in carrying a large stock of infrequently used items. A selection shall also be made where New and Nonofficial Remedies lists identical products of several manufacturers.

Preparations carried by the pharmacy, excluding such sera and expensive preparations as may be determined from time to time by the Administration and Pharmacy Committee shall be included in room charge to patients. The Pharmacy shall procure other drugs or preparations for hospital patients on request of the visiting physician. Such special orders, however, are to be charged to the patient.

The Pharmacy Committee shall provide a book known as "The Hospital Formulary" and revise it from time to time. It is to be considered as supplementary to the United States Pharmacopœia, National Formulary and New and Nonofficial Remedies. It is to contain those preparations of drugs and chemicals, sizes of tablets, ampuls, suppositories, etc., which are kept by the pharmacy and may be called for under distinctive titles, and which are ready to be dispensed either to Out-Patient or Hospital Departments. Its purpose may be said to be one of convenience in ordering and prescribing.

No new drug or preparation is to be carried by the pharmacy until it has been recommended by the Pharmacy Committee and approved by the Medical Council.

PROPRIETARY PREPARATIONS NOT IN THE NEW AND NONOFFICIAL REMEDIES OR OF A PARTICULAR MANUFACTURER.

Any drug or preparation, not carried by the pharmacy, which is requested by a visiting physician for a private patient will be procured from an outside pharmacy in the amount ordered by the physician and charged to the patient.

DRUGS FOR RESEARCH.

The above regulations are not intended to hamper the controlled study of any drug or proprietary article. The pharmacy will, therefore, supply a specified amount of any preparation for a member of the teaching staff after the approval of the head of his service. When this supply is exhausted more will not be supplied, nor will it be added to the pharmacy stock until a report showing its value has been given to the Pharmacy Committee.

The authors expressed thanks for the privilege of presenting this paper and regret that they could not be present for discussion of it, and their appreciation of the kindness of Dr. T. C. Daniels for his willingness to read it to the Clinical Congress of the American College of Surgeons.

THE CONFERENCE OF PHARMACEUTICAL LAW ENFORCEMENT OFFICIALS

MINUTES OF THE CONFERENCE OF PHARMACEUTICAL LAW ENFORCEMENT OFFICIALS.

Multnomah Hotel, Portland, Oregon.

August 8, 1935.

The Seventh Annual Meeting of the Conference of Pharmaceutical Law Enforcement Officials was convened by Chairman R. L. Swain, at 9:30 A.M. in the Club Room, with the following present:

A. L. I. Winne	Virginia	F. V. McCullough	Indiana
L. L. Walton	Pennsylvania	F. L. Christenson	Idaho
C. L. O'Connell	Pennsylvania	John Culley	California
Roy Cook	W. Virginia	W. M. Fulton	California
G. L. Hayman	W. Virginia	F. E. Mortensen	California
C. T. Gilbert	Connecticut	Edna E. Gleason	California
R. C. Schultz	Wyoming	W. B. Rutherford	California
E. F. Hart	Washington	Roy S. Warnack	California
P. H. Brady	Washington	Arthur Baker	Colorado
R. L. Parrish	Oregon	W. J. Bishop	Colorado
Alfred Wiehmark	Oregon	E. J. Prochaskz	Minnesota
A. F. Peterson	Montana	R. L. Swain	Maryland
Hugo Schaefer	New York	F. H. King	Ohio
Fred Schaefer	New York	M. N. Ford	Ohio
R. S. Lehman	New York		

Chairman Swain had no prepared address, however, he reviewed the work of the Conference in the past, in detail. Chairman Swain then called upon the Secretary and Treasurer, for his report.

REPORT OF SECRETARY AND TREASURER.

On June 26, 1934, we sent out 300 copies, by first class mail, of reprints of the 1933 meeting of the Conference.

Since the last annual meeting of the Conference, the Secretary, on September 7, 1934, distributed by first class mail, 315 copies of a compilation by Chairman Swain on the subject of "Temporary Absence."

On December 14, 1934, we also sent out 300 copies, as first class mail, of the reprints for the 1934 meeting of the Conference.

At the end of our last annual meeting, we had on hand $280.67, with no outstanding bills. Following our last annual meeting, Chairman F. C. A. Schaefer and his finance committee, made another appeal for finances from state boards and individual members interested in the Conference. From that appeal he secured $99.00, as follows:

John Seiden, Montana	$2.00	V. C. Piakowski, Michigan	3.00
H. A. Stype, Ohio	1.00	C. H. Ganger, New York	2.00
Colorado Board	5.00	F. S. Houch, New York	3.00
H. R. Rudy, Maryland	1.00	J. Leon Lascoff, New York	2.00
Leon Marr, Maine	2.00	Geo. C. Dieckman, New York	2.00

Iowa	10.00	H. C. Christenson, Illinois	5.00
Alabama	5.00	New York Board	10.00
W. H. Roberts, New York	2.00	Kansas Board	10.00
E. E. Chilson, New York	2.00	Washington Board	10.00
Geo. W. Mather, New York	2.00	Minnesota Board	5.00
Wm. Mansfield, New York	2.00	Oscar Rennebohm, Wisconsin	1.00
Hugo H. Schaefer, New York	3.00	Berthold M. Kremer, Wisconsin	1.00
F. C. A. Schaefer, New York	3.00	Edith G. Schmitz, Wisconsin	1.00
Geo. Blackalls, Connecticut	1.00	H. G. Reunzel, Wisconsin	1.00
W. C. Anderson, New York	2.00		

For the present year, the Finance Committee sent out another appeal for a ten-dollar contribution from each state, or whatever amount could be paid, and from that appeal, Chairman Schaefer received $111.00, as follows:

Ohio	$10.00	Florida	5.00
Iowa	10.00	Maine	5.00
North Dakota	10.00	Pennsylvania	5.00
Kansas	10.00	Maryland	10.00
New Jersey	10.00	Minnesota	5.00
New York	11.00	Oregon	5.00
Alabama	5.00	Wisconsin	10.00

This makes a total of $210.00 received since our last annual meeting. Balance on hand May 10, 1934, $280.67, making a total of $490.67. Bills paid since our last annual meeting are as follows:

May 22, 1934, E. G. Eberle, printing of proceedings	$ 50.00
July 3, 1934, Dr. Hugo Schaefer, expense for finance com	26.80
Jan. 2, 1935, E. G. Eberle, reprints	23.76
July 20, 1935, R. L. Swain, postage and stationery	8.70
Total expenditure	$109.26
Leaving a total balance to date of	$381.41

Upon motion of Mr. Schaefer, seconded by Mr. Gilbert, the Report of the Secretary-Treasurer was approved.

REPORT OF THE FINANCE COMMITTEE.

F. C. A. Schaefer, Chairman of the Finance Committee, reported that subsequent to the last annual meeting, the committee had decided to contact Pharmaceutical Law Enforcement Officials and also individuals who might be interested in the Conference, for additional finances. An appeal went out, from which the Secretary received $99.00. From this appeal, most of the contributions received came from individuals as a personal donation for the reason it could not be paid out of departmental funds.

For the present year, an appeal was made to each state board and those having to do with law enforcement, for a sum of ten dollars and from this appeal, the committee received fourteen replies and have promises from others who said their contributions would follow.

Respectfully submitted,
F. C. A. SCHAEFER, *Chairman.*

Chairman Swain called for the next item on the program, which was an address from Harry C. Huse, Director of Licenses for the State of Washington. Mr. Huse being absent, his paper was presented by P. H. Brady of the State of Washington, which is as follows:

"You will notice from your program that this paper was to be handled by Harry C. Huse, Director of the Department of Licenses of the State of Washington. However, since your pro-

gram was prepared the state of Washington has a Board of Pharmacy entirely free from its Department of Licenses to enforce the pharmaceutical laws.

"It is very gratifying that at this first conference of the National Association of Boards of Pharmacy here in the Pacific Northwest that we have a board of pharmacy to represent the State of Washington.

"This restoration of self government to the pharmacists of this state due to the untiring efforts of the officers and many of the members of the W. S. P. A. and the coöperation of Governor Martin and the legislature of 1935 is an exemplification of that outstanding principle that every industry can best regulate its own affairs and solve its own problems. And now that we have this measure of autonomy the responsibility for its success or failure rests entirely with the pharmacists of the state.

"The Pharmacy Board may be considered as a committee of three selected from the ranks of the registered pharmacists of Washington to supervise the pharmacy laws and regulations of the state.

"I would like to present two pictures to you. One is the sorry spectacle of this committee of three, with very limited resources, trying to enforce the pharmacy law against the will of the pharmacists of the state. The other is a picture of your District Councils adjusting every difficulty possible in a friendly coöperative manner and as a last resort presenting those cases which cannot be so handled to the Pharmacy Board for prosecution. As originally drawn up the measure instituting the District Councils provided for a Director of Law enforcement. This work may be handled through your director of Fair Trade Practice but if it proves too much of a burden together with other duties a Director of Law Enforcement should be elected to handle the matter.

"The pharmacy law is primarily a safeguard for the public. In the next place it is a measure of protection not only for law-abiding drug store owners, but also for Registered Pharmacist employees. The State of Washington, along with other states, now demands a four-year course of education and preparation for the students in pharmacy. There is an implied contract in this to the extent that the State should see to it that unqualified persons are not illegally performing the work of unemployed pharmacists.

"The guiding principle of your Board of Pharmacy will be that the practice of pharmacy is reserved for registered pharmacists just as much so as the practice of Medicine or Surgery or Dentistry is reserved for registered physicians, surgeons and dentists. A corporation or an individual may invest money in a drug store but this capital investment does not carry with it the privilege of performing those functions which are reserved by law to Registered Pharmacists.

"And so, in carrying out these principles, your committee of three would ask the District Councils for coöperation in the following matters: Pharmacy renewals. To check up shopkeepers who are offering for sale drug store merchandise and inspecting those shop-keepers who are advertising drug departments or use the word 'drug' in any form of advertising. We would also ask your assistance in the matter of checking up on vendors selling household remedies and suggest that you seek the coöperation of your local city and county authorities in this matter. While it does not come directly under the administration of the Pharmacy Law, your Board suggests that you obtain a list of unemployed registered pharmacists in your district and endeavor to work out a relief system to put men to work.

"With the limited resources at our command for the next two years it is only through cooperation of this kind that the new pharmacy law can be effective. If the next legislature grants us a larger appropriation we will be able to carry on this work through inspectors but even then this can best be accomplished through the agency of the District Councils.

"In closing we would say that it is our ambition to place and maintain the profession of pharmacy in the State of Washington on as high a standard as in any state in the Union.

"Approximately $26,000.00 a year into the State Treasury. All money must go to the State Treasury. Then the State Legislature appropriates the money. We have only $10,000.00 for two years. We might ask for a deficiency appropriation—we are going to ask for more money at the next legislature. We have our new pharmacy law and one of the points in it is that all shopkeepers who use words to make the public think of drug stores must have a registered pharmacist to supervise the work.... It was simply a matter of collecting taxes without any great effort to enforce the Pharmacy law. Physicians of Spokane County would handle the matter very thoroughly themselves and that is what I am trying to get the pharmacists to do."

The paper was discussed by Messrs. Cook, Swain, Rutherford and Fulton.

DISCUSSION.

Mr. Cook: "What constitutes a shop-keeper?"

Mr. Brady: "A grocery store that handles Castoria, Mentholatum, etc. If they use the word 'drugs' in any way, then they must have a registered pharmacist in attendance."

Mr. Cook: "In the state of Washington, what is the attitude of the Board of Pharmacy and what can they do about such a situation?"

Mr. Brady: "When they have a sign up saying 'Leave prescriptions here.' That can only be done by a registered pharmacist at all times, even if he does not fill them—our interpretation is receiving, is dispensing. There are members of the legislature who are shop-keepers and that is why the fee was reduced from $6.00 to $2.00."

Mr. Swain: "Does the Board have any full-time employees to take care of this work?"

Mr. Brady: "Mrs. Adams has been turned over to us on a part-time basis. All our records are at Olympia and she looks after it all. The Department of Licenses pays the major part of her salary and we pay the rest."

Mr. Swain: "Is there any member of your Board who is a full-time member?"

Mr. Brady: "No. We are putting a paid inspector to work on September 16th to inspect and report and if the thing is to be taken care of at once, he takes it up to the prosecuting attorney."

Mr. Swain: "What license do the itinerant vendors pay?"

Mr. Brady: "Two dollars per year."

Mr. Swain: "How many?"

Mr. Brady: "They are working on that now and it's very difficult to find out. In the past, these companies have been very willing to coöperate. The first step is to write to them and get the names of their individual agents. Twenty such fees have been paid."

Question: "What do these vendors sell?"

Mr. Brady: "Household liniments and veterinary remedies."

Mr. Swain: "Do you enforce the law that department stores cannot use the words 'patent medicines?' "

Mr. Brady: "They could not without using a registered pharmacist. They usually employ registered pharmacists—girls."

Mr. Rutherford: "Does your Board register Asiatics?"

Mr. Brady: "They have to be citizens of the United States—foreign born is all right as long as they are naturalized citizens."

Mr. Fulton: "It might be of interest to know that we have pharmacists, assistant pharmacists, general dealers, itinerant vendors. We have general dealer licenses if they are 3 miles from a drug store—they can sell any medicine that is trade-marked and registered. We give them a list of what they can sell. Our itinerant vendor license is $100.00 a year. Nobody can run a prescription drug store unless he has a pharmacist in charge from the time he turns the key until he shuts the door. No exceptions of any kind. No one can use the word 'drugs' unless he is a registered pharmacist. They have no agents any more, or dealers. Ford did have Ford dealers. Now he has agents. They buy the stuff and then they have no further responsibility. We have seven inspectors and four of them will work wholly on itinerant vendors and general dealers. Last week we had one fellow get five itinerant vendors and about twenty general dealers. We catch more druggists violating the poison law than others. We have a lot of first-class druggists in California and some that don't want to live up to the law. We gave one of these, in San Francisco, seven prescriptions and on five of them he substituted. They are hurting the business and not helping anybody else."

At this time, Chairman Swain appointed a nominating committee consisting of C. T. Gilbert, *Chairman;* Fred Schaefer and F. V. McCullough, with instructions to bring in nominations for a Chairman, Secretary and Treasurer and Delegate to the House of Delegates.

Frank L. Christenson, President of the Idaho Board of Pharmacy, explains the Idaho laws, as follows:

"It might be said that I have been interested in this work for several years. I have studied the laws of every state, even the Dominion of Canada, very seriously with the help of some good

legal authorities. I have obtained practically every decision rendered for the past 15 years. I want to make a statement that we have a very unsatisfactory set-up in Idaho. I am attempting to operate a 'bluffer' act. So long as I am on friendly terms with the state police and the government I am getting by very nicely. We have no money to enforce, just as Mr. Brady said, 'all of our funds at the present time have to go into the State treasury and it takes an appropriation to get them back out.' For your information: I am one of those trying to raise about two million dollars in this state for relief, and I think one of the best ways would be to put a tax upon peddlers and agents of about $500.00 or more. As Mr. Mortensen said, 'when they start to tear your bill apart, place another before them and get them to fight and you will generally get a compromise.' Until 1937 we will be operating under what is commonly termed the 'bluffers' act."

Mr. A. L. I. Winne, of Virginia, talks on the subject of the difference between patent and proprietary medicines, as follows:

"Relative to the difference between patent and proprietary medicines.

"The committee has done nothing since the time it rendered a report. At that time we did get the information from all over the United States and found it deplorably deficient; as a matter of fact. I believe my own state is the only one that has a definition and it is a very poor definition. Some of the states have what might be constituted as a casual definition but nowhere in the United States could I find a clean-cut definition. We talk about patent medicines. We talk about proprietary medicines. In the eyes of the law, a patent medicine is a proprietary medicine. It says the nature of the remedy must be on the label, address must be on the label, directions for its use must be on the label. I have found that useful sometimes when you go in and find some remedy that does not have a label which states for what it is intended to be used. We just tell them to throw it out. That is the 'bluffer' law. This subject has got to be studied further and I think good legal talent will have to be employed to get a definition that will hold water. I think that in most states patent medicines are going to be sold in general stores. Most states have legislatures very much like that in Idaho. I think that is the most difficult thing we have to face—how to put a good definition over and still not encounter the opposition of the people who are sympathetic with the dealers in the stores out in the country. There is no drug store there—people need the medicine. They have to find somebody to sell the medicine." Mr. Cook made a motion seconded by Mr. Gilbert that Mr. Winne's committee on definition of "Patent and Proprietary Medicines" be continued.—Motion carried.

DISCUSSION.

Fred Schaefer: "In New York we have never had any difficulty with that. We have handled them as a class."

Mr. Christenson, Idaho: "We are not attempting to differentiate between those two terms but we are attempting to segregate advertised package remedies and pharmaceutical preparations. Those who own a process patent and have a copyrighted label have the exclusive right to the finished product and still it's proprietary."

Mr. Schaefer: "Why can't the law simply read patent or proprietary medicine and include both?"

Mr. Christenson, Idaho: "There are two types of patent and proprietary medicines. We handle those all as one."

Mr. Winne: "You can't draw a distinction between patent and proprietary medicine. What we call patent medicines are not patent medicines at all. We have to draw a line of demarcation between those that are intended for self-medication and those intended for use of physicians. Just as soon as we attempt to draw up a definition which will segregate those things, they will throw them out into the other class. We have to draw up a definition and draw it up good and tight so it will not matter how they change their labels."

The subject was further discussed by Messrs. Culley, Hugo Schaefer, Christenson, Swain, Fulton, Rutherford, Winne and Cook. Upon motion by Mr. Cook, seconded by Mr. Gilbert, the Winne committee on the definition of patent and proprietary medicines was ordered continued.

Mrs. Edna Gleason of California discussed legislation effecting the control of pharmacies, pharmacists and the manufacture and distribution of drugs and medicines, as follows:

"I am naturally very interested to know what the other Boards of Pharmacy were doing

but I think that maybe California (I don't want to say takes the lead) but I think that we are just a jump ahead of other states. I want to say perhaps it is because we have seven members on our Board of Pharmacy and maybe we have sold the idea to the people of California as well as to the legislature that we are looking out for the public health and safety of the people.

"The Board of Pharmacy has the right to make rulings not inconsistent with the laws of California. Di-nitro-phenol can be sold by no one except by a registered pharmacist and that is on a prescription and only can be refilled by a doctor's orders. Many of you have been reading the journals recently of the results of thyroid. We feel that making a move like that is the first step toward real coöperation in bringing back a closer relationship of the doctor and the druggist—when we will refrain from selling anything of which we don't know the contents.

"We have $94,000.00 and we can't begin to do the things that we feel should be done to carry on our work successfully and be a credit to the state. We are trying to do it but we can't do it without finances. We started this year to put over a bill in the legislature. We find that what is good for one should be good for them all. We find that the little druggist who wants the other fellow to behave, doesn't want to behave himself. We are going to help police the industry and then our enforcement is going to be a very minor affair. The little fellow knows what's good for the other fellow, but he doesn't want to take the same medicine himself.

"You can get anything that you believe in. They said we couldn't do anything against chain stores. All the money in the world can't combat man-power. We proved it. You can have whatever legislation you want if you go there with a firm purpose. If your policy is right and you are looking out for your community or the people, at large, you will be heard—if you are willing to abide by the law and say 'this is going to pinch me a little bit but it's good for the other fellows.' If you believe in what you are doing and you know you're right, you have to convince the other fellows. We criticise the man that makes more laws. Why do we want more laws when we have laws now that are never obeyed?

Edna Gleason: "Our college requirements are 3200 hours, only one examination to be given to a student immediately upon his graduation and he is given a certificate and as soon as he has proven his year's experience he can come back and is then given his diploma. He does not have to take two examinations as he has in the past. He must have that examination during his college. He has his experience year after he takes the examination to get his certificate and if he doesn't make 75 he cannot get his certificate."

Question: "What about your reciprocity?"

Edna Gleason: "In order to protect our men we have had to refrain from any reciprocity. We have had an overflow of as high as 3000 or 4000 unemployed druggists. We had to protect our men and keep the other fellows from coming in. People are willing to work for $18.00 and $20.00 a week because there has been that influx of people coming into the state."

Dr. Hugo Schaefer, of New York, took the place on the program of Mr. Geo. Mather and explained provisions of the Dunkel Bill in their state, as follows:

"I will restrict my talk to the Dunkel Bill. Several years ago when we were working under our old law, the Board of Pharmacy was in control of all medicines with exception of proprietary or patent medicines, this left a large loop-hole. Two years ago we passed the Dunkel Bill, this placed under the control of the Board of Pharmacy, the sale of all proprietary medicines which were harmful or habit-forming. During last winter the Board of Pharmacy drew up the regulations for the sale of these preparations which were put under their control—regulation which governs the sale—that these preparations, patent or proprietary, which are habit-forming or deleterious can only be sold by registered pharmacists—to have a measure of safety in a drug store which we would not have in a grocery store. If a man is working one day in a grocery store and he sells a preparation illegally and if he is working for a druggist it is legal—does not seem quite right. Therefore, the sale must be made by a registered pharmacist. The grocer couldn't very well say whether the patent medicine contains a harmful or habit-forming substance and they therefore last year passed a labeling law which requires that every patent medicine or proprietary medicine, if it contains any of these ingredients that it must have that ingredient on the label, put on by the manufacturer, with the quantity thereof. The manufacturer's name and address must be on the label and the preparation must be manufactured under the supervision of a pharmacist or chemist. Our law defines anything as a poison which may cause death to the

human adult life in a 60-grain dose—that preparation can in future only be sold in registered pharmacies by registered pharmacists."

Mr. Gilbert: "Does the New York law define what a chemist is?"

Dr. Schaefer: "We left the law that way because we were afraid to make it simply a pharmacist—there are certain lines where a chemist would be just as much in order. We put in the word 'chemist' even though we have no definition for a chemist at the present time. The Board took it up at its last meeting. Don't know whether it was finally accepted or not."

Dr. Schaefer's remarks were discussed by Messrs. Culley, Swain, Gilbert, Walton and Winne.

Mr. R. C. Schultz, of Wyoming, makes a report of conditions in his state, as follows:

"There was no legislature enacted at the last session of the Wyoming legislature. However the Board of Pharmacy on April 8th of this year had a conference with the Attorney-General of the State of Wyoming for the purpose of examining the laws that we had to see if something in the nature of enforcement could be had simply by interpretations. A two-day conference was held with the Attorney-General. There was much interest in the discussion on patent and proprietary medicines, because we find that the Rocky Mountain states have about the same law on patent and proprietary medicines. The Board of Pharmacy of Wyoming will endeavor to enforce them and of course there are differences in the law in different states and the only thing the Board of Pharmacy can do is to apply them to their own particular state. Wyoming does not have a license fee for drug stores.

QUOTE: RULES AND REGULATIONS OF THE WYOMING COMMISSION OF PHARMACY, adopted April 8, 1935. Page 14 of the Pharmacy Laws of the State of Wyoming, together with the Rules and Regulations of the Commission of Pharmacy.

Wyoming is called the state of the great wide-open spaces. We only have 122 drug stores in the entire state and inspection is made once a year. Naturally the funds of the state are not very extensive, possibly as low as any state in the Union, although we were able a few years ago to get the Board of Pharmacy on a self-sustaining basis. Money does not go into a general fund at all—in the hands of the State Treasurer—but paid out only on the order of the Board of Pharmacy."

Mr. A. F. Peterson, of Montana, reports as follows:

"At the last session of the legislature in Montana they spent most of their efforts killing the legislation that would be hard on the drug business. A contraceptive act was passed which limits the sale of all contraceptives to a drug store. Merely possession of a stock by anyone outside of a drug store is a violation. An inspector discovering it, confiscates it. The legislature passed a poison register law, which requires druggists to make out an affidavit each time a poison is sold and gives the Board of Pharmacy the power to designate what is a poison. In Montana we have just inaugurated our first law-enforcing campaign. The state is so large and the expense so great, it is impossible to raise the money. When drugs are sold in a drug store they are regulated by the State Board of Pharmacy but if they are sold any place else they are not regulated, so the inspector had a very fertile field to work in. After being on the road for two months, only a small part of the state was covered. He has not lost a single case—every violator that he has cited in court, with one exception was cited for selling aspirin. I do not think there is any chance of losing that case. Our enforcing campaign has only been operating for two months—we have noticed a lot of improvement. The principal violators are the grocery stores, some of the wholesale grocers have put in lines of drugs."

Mr. John Culley, makes a report for the State of Nevada, as follows:

"Nevada is instituting a campaign for bringing everybody up to registration requirements. There are only 48 drugs tores and five of those are owned by two people, so there are really only 44 proprietors in the state of Nevada. There is only one registered assistant in Nevada and he is going to take the examination next Fall."

Roy Cook, of West Virginia, gives the following report for his State:

"It seems to me that if some way could be set up by which we could sit down and exchange our copies of laws, forms, blanks of all kinds, from one state to the other, it would be very helpful. I have been interested in our young friend in the house of delegates in Idaho. He has my sympathy. I would suggest that if he could enable us to control Senator Borah that that would be helpful. In West Virginia last year we have had some changes in connection with the alcohol and liquor situation. Out of 425 stores, 212 carry beverage sale permits. Those that traffic from one state to another always have something that cannot be tolerated—they attempted to compel the pharmacist to buy alcohol from or through but mostly from these various beverage control commissions. It had to be purchased from the commission and a charge of $10.00 was made regardless of whether liquor was sold or not. The state added to that a profit. Ten dollars was paid for a permit, $7.25 for a can of alcohol and 50 cents for having it delivered. Then it was announced that a pharmacist could buy alcohol from the liquor stores and would not have to pay the $10.00 license fee. Some did this and were hailed up on the grounds that it made them manufacturers.

"Just before I left the city of Charleston, by inviting the Attorney-General out to two or three dinners, he decided that he could find a loop-hole in this. One of the very best things we have done in West Virginia is to borrow from Virginia a few changes and get a new permit law. It creates confidence."

Upon motion, duly seconded, the Conference adjourned at 12:45 P.M. to meet in joint session at 8:00 P.M.

The Conference convened at 9:00 P.M., August 8th, in the Junior Ball Room of Hotel Multnomah, in joint session with the Section on Education and Legislation and the Conference of Pharmaceutical Secretaries.

The Joint Session was called to order by Chairman McCullough of the Secretaries, and the record of this meeting will be printed elsewhere.[1]

The Second Section of the Conference of Pharmaceutical Law Enforcement Officials was called to order by Chairman Swain at 9:50 A.M. in the Junior Ball Room, August 9, 1935. The following were present:

P. H. Brody	Washington	S. L. Hilton	Dist. of Columbia
Roy Cook	W. Virginia	C. T. Gilbert	Connecticut
G. L. Hayman	W. Virginia	F. L. Christenson	Idaho
R. P. Fischelis	New Jersey	R. A. Lyman	Nebraska
L. L. Walton	Pennsylvania	Zada Cooper	Iowa
E. F. Cook	Pennsylvania	W. J. Teeters	Iowa
W. B. Day	Illinois	C. E. Mollett	Montana
Edna Gleason	California	R. L. Swain	Maryland
Fred Schaefer	New York	F. H. King	Ohio
Hugo Schaefer	New York	M. N. Ford	Ohio

Chairman Swain referred to the program and asked that the first number under item seven, be discussed. This subject was discussed by the Chairman, also Fred Schaefer, Hugo Schaefer, Mrs. Gleason, Mr. Brody, Mr. Cook and Mr. Day.

At this point the Chairman stopped the discussion and proceeded to the next question "Should Boards of Pharmacy be empowered to regulate the number of drug stores, and, if so, what shall be the basis of such regulation?" Discussion was general and many good points were brought out.

The question, "What can be done to further restrict to pharmacists the distribution of potent drugs and medicines and medicines in general" came up. This subject was continued at this time without discussion.

The next question "Have the barbituric acid laws worked out satisfactorily" was discussed. The general impression was that longer experience was needed to answer this question.

The next question to be discussed was "Should Law Enforcement Officials attempt some program looking to supervised experience?" This subject was ordered continued for the next year.

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[1] February JOURNAL.

The subject to come up next for discussion was "What enforcement difficulties have been met with under the Uniform State Narcotic Act?" This subject was held over.

At this time the Chairman referred to the Finance Committee and upon motion by Mr. Gilbert, seconded by Mr. King, the Finance Committee was ordered continued.

The Chairman next referred to the advisability of sending out reprints of this meeting. Upon motion by Mr. Fred Schaefer, seconded by Mr. Gilbert, reprints of the meeting were ordered distributed to members and others interested.

Upon motion by Mr. Hugo Schaefer, duly seconded, the remainder of the program was ordered postponed.

At this time the Chairman asked for the report of the Nominating Committee. Chairman Gilbert of the Nominating Committee made the following report:

For *Chairman*, R. L. Swain, Maryland
For *Secretary-Treasurer*, M. N. Ford, Ohio
For *Delegate to House of Delegates*, Fred Schaefer, New York.

Your committee recommends the same officers be continued for the ensuing year.

Upon motion by Mr. Cook, seconded by Mr. King, the report of the Nominating Committee was received and the same officers continued for the ensuing year.

Chairman Swain then referred to the difficulty in getting attendance for the meetings and asked the advisability of holding the first meeting next year on a Sunday Evening or Sunday Night, previous to the opening of the Convention.

Upon motion duly seconded, the Chairman was empowered to arrange the program for next year as he may deem advisable.

Upon motion duly seconded, the Conference adjourned at 12:15 P.M.

M. N. FORD, *Secretary-Treasurer.*

NOTE: It was necessary to defer the Abstracts of the Minutes of the Conference of Pharmaceutical Association Secretaries to the February JOURNAL.

THE TEXAS CENTENNIAL.

The Texas Centennial will be different; while the central celebration will be in Dallas, where the gigantic construction program is now bringing into being the buildings that will house the Texas Centennial Exposition, many other cities and all sections of the State will prepare for special celebrations. San Antonio will be the scene of a beautiful commemoration at the Alamo; Houston will hold an impressive San Jacinto exposition; Tyler will have its Rose Festival on a more beautiful and larger scale and Corpus Christi a water pageant—these are only a few of the many other colorful celebrations which will dot the State throughout the Centennial Year.

THE CITY OF MEXICO.

The interesting city of Mexico was founded by the Aztecs about 1325. Aztec writing, recently, was brought to the attention of pharmacists by the rediscovery of the Badianus Manuscript.[1] The City is situated about 7400 feet above sea-level; Popocatepetl is about 40 miles to the southeast, its peak is 17,550 feet; and its crater about 2000 feet wide.

SALT LAKE CITY MAY ESTABLISH A CLERK SCHOOL.

Salt Lake City druggists contemplate the organization of a local association and they are considering the suggestion of the American Vocational Association to establish a training school for clerks. D. R. Gardeman has been giving lectures on the subject.

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[1] See September JOURNAL, page 771.

ABSTRACTS OF THE MINUTES OF THE SECTIONS, AMERICAN PHARMACEUTICAL ASSOCIATION

(*Continued from page 1021, November Journal.*)

SECTION ON COMMERCIAL INTERESTS.

Additions and corrections of the abstracts invited.

The First Session of the Section on Commercial Interests was called to order by Chairman Henry Brown on August 7th, at 2:00 P.M. He welcomed those in attendance and then presented his address: it follows:

ADDRESS OF THE CHAIRMAN.

BY HENRY BROWN.

The Section on Commercial Interests has rapidly taken an important part of the sessions of the AMERICAN PHARMACEUTICAL ASSOCIATION conventions, the papers presented are typical of the various phases of American pharmacy. This year, I am happy to state, we have excelled in our program, although a few of our eastern authors are unable to attend, we have been fortunate in having a number of papers, to be presented by our western members, who have been very generous with their time and efforts.

The Chairman is extremely grateful to the various contributors and hopes the discussions will be to the point and as brief as possible, due to our lengthy program.

May I thank this large group for their interest in our Section, I feel that they will be amply repaid for their attendance.

The report was accepted.

The report of Secretary R. T. Lakey was read by Vice-Chairman Robert W. Rodman owing to the absence of the former.

REPORT OF THE SECRETARY.

BY R. T. LAKEY.

"We sent out on official stationery of the Section on Commercial Interests 139 letters asking for contributions of papers to individuals who we thought might be interested in the work of our Section. We secured 17 acceptances, one of which was a paper dealing more with the education of pharmacy students, and this paper was turned over to and accepted by the Committee on Education and Legislation.

"I want to thank our members on the West Coast for the fine coöperation received from them. I was especially desirous to get as many papers as possible from this section so that the visitors from the other parts of the country might hear from them as they are seldom in attendance at our meetings that are held in the East. Also my thanks are extended to Chairman Brown, Vice-Chairman Rodman, John A. J. Funk, and Deans Mickelsen and Ziefle for advice and help.

"I trust that the program will prove interesting and I keenly regret my unavoidable absence. The expenses incurred amounted to $5.11 for postage."

The report was accepted.

The first paper called for was, "What Determines Net Profit."—Not submitted.

The next paper "The Pharmacist Studies Law" was read by Charles G. Ajax. (Printed in the October JOURNAL, pages 863–865.)

"Merchandising Your Profession" by Ralph A. Beegle was submitted. (No discussion.)

"The California Fair Trade Act" by Ira Darling was presented and discussed. (It is printed in the November JOURNAL, pages 981–987.)

"The Place of Commercial Subjects in the Pharmacy Curriculum" by Neal B. Brown was submitted. (It is printed in the November JOURNAL, pages 987–990; no discussion.)

"How to Help the Pharmacist Commercially" by E. C. Brokmeyer, is published in the October JOURNAL, pages 861–865.—No discussion.

Titles of the following papers were read, but no papers submitted: "The Fair Trade Acts

and Their Effects," by Paul C. Olsen. "Dogs, Cats, Birds, and Babies" by Alice-Esther Garvin.—Not submitted.

"Prescription Pricing" by Frank A. Delgado was submitted. No discussion.

SECOND SESSION.

The Second Session of the Section on Commercial Interests was called to order by Chairman Henry Brown, August 8th, at 9:00 A.M.

Reading of papers was continued. "Local Biological Sale Survey" by Clarence M. Brown.—To be submitted.

"Discussion of the Lilly Digests," by J. F. McCloskey.—To be submitted.

"The Futility of Cutting Prices and a Comparative Price Survey of Two States," by George M. Archambault.—Read by Henry F. Hein. (No discussion.)

"The Visible Prescription Department," by George W. Fiero.—Printed in the November JOURNAL, pages 973-974. (No discussion.)

"A Course in the Study of Drug Store Sundries," by Haakon Bang.

"A Scientific Study of the Merchandising Value of Windows," by F. A. Geue.—Read but not submitted.

The Committee on Nominations submitted a report, presenting the following nominees: *Chairman*, R. W. Rodman, New York; *Vice-Chairman*, R. T. Lakey, Detroit; *Secretary*, H. F. Hein, San Antonio, Tex.; *Delegate to the House of Delegates*, Henry Brown, Pennsylvania. On motion duly seconded and a vote the nominees were duly elected and installed; the Section was then adjourned.

NOTE: The Abstracts of the Minutes of the Sections will be concluded in the February JOURNAL.

RESEARCH GRANTS.

Recipients of grants from the Committee on Scientific Research of the American Medical Association include Dr. Frank R. Menne, professor of pathology at the University of Oregon Medical School, for a study of cholesteremia in rabbits; Dr. Lloyd H. Ziegler and Dr. Arthur Knudson, of the Albany Medical College, Albany, N. Y., for completion of their work on activity after recovery from rickets, and F. A. and E. L. Gibbs toward the completion of a study of the regions in the cat's brain which have an especially low convulsion threshold. The work is to be done in the department of physiology of the Harvard Medical School.

TESTIMONIAL DINNER.

A testimonial dinner was tendered **Thomas S. Smith,** *Chairman* of the N. A. R. D. Executive Committee, November 7th, at Hotel Dupont, Wilmington, Del. Pharmacists were present from Connecticut, District of Columbia, Delaware, Maryland, Pennsylvania, other states, and friends not engaged in pharmacy. Walter Morgan, of Wilmington, presided and was pronounced an ideal toastmaster. The guest of honor was presented with a porch rocking chair and a handsome traveling bag. The evening was a most delightful one and the speeches brief and happy.

FEES OF BOARD OF PHARMACY IN TEXAS.

It was held by the Civil Court of Appeals, Texas, that fees collected by the State Board of Pharmacy cannot be turned over to the Texas Pharmaceutical Association and the clause of the law providing for it is unconstitutional and void. The Court affirmed the case of the Association against C. B. Allison and others, members of the Texas State Board of Pharmacy.

Section 140 of Chapter 107, acts of the Forty-First Legislature, provides that the Association should be given up to $2.00 of each $3.00 annual renewal fee of active registered pharmacists and $1.00 of the $2.00 assessed against inactive pharmacists. In 1933 the board collected $14,942.00 of such fees and after paying its expenses had $9553.00 remaining which the Association sued to recover. It was held by the trial court and sustained by the appellate court that the provision making such allocation is void as violative of Section 51, Article 3, of the Constitution, on the ground that it is public money and cannot be diverted to a private purpose or to a private corporation. All other provisions of the act are upheld, specific mention being made of the validity of the sections imposing the annual renewal fees.

EDITORIAL NOTES

A CORRECTION.

It is regretted that an inadvertent error on page 1049, December JOURNAL, was permitted to pass. Please correct—"January 1, 1920" to read "January 1, 1820."

PHARMACISTS IN PUBLIC HEALTH SERVICE ADVANCED.

The following Assistant Pharmacists in the Public Health Service have been advanced to the rank of Passed Assistant Pharmacist to take effect as such from September 5, 1935: Raymond D. Kinsey, Walter H. Keen, Clarence H. Bierman and Thomas C. Armstrong.

HARTMAN'S SOLUTION.

Thymol, 1¼ parts, by weight
Ethyl alcohol, 1 part, by weight
Sulphuric ether, 2 parts, by weight.

Keep tightly corked in a brown glass bottle. Use cork or tin-lined stoppers only. The application is made on a pellet of cotton, directly to the dentin or caries. Use rubber dam.

The formula of this desensitizer was given first-page notice in the *New York Times* of January 22nd, and the discovery is credited to Dr. LeRoy L. Hartman, professor of Dentistry in the Columbia School of Dentistry and Oral Surgery. The formula was given out at a special joint meeting of the First and Second District Dental Society of New York following a dinner in Dr. Hartman's honor, who, in responding, said that this is his humble contribution to humanity as he hopes it will be the means of relieving much unnecessary suffering.

It was stated by a dentist to rank with the discovery of the anesthetic properties of nitrous oxide in 1844 by Dr. Horace Wells. A basic patent was obtained by Columbia University but it was decided by Dr. Hartman and the Columbia University authorities not to take the patent up but give it free to the world. It seems that the value of the formula is not only in the constituents but also in the method of compounding the solvent. Dr. Hartman cautioned that its use by the public as a self-remedy against toothache may result in more harm than good. The preparation must be applied directly to the dentin as it does not penetrate the enamel. It is stated to be effective for twenty minutes to an hour during which time virtually any cavity may be prepared for filling.

Since the foregoing announcement Dr. Paul Jesserich of the University of Michigan has questioned the outstanding value of the discovery.

CASCARA SAGRADA: AN UNUSUAL ADULTERANT.

BY H. W. BLAIR, M.P.S.

This note refers to an incident occurring in ordinary experience. The adulterant has neither medical properties nor any faint resemblance to cascara sagrada. The purchase of a drug like cascara is done by sample, quotation and specification, and the consignment in question was guaranteed to be a very fine specimen of five-year-old bark. The sampling and examination of the bulk brought to light a very curious, stupid and obvious adulteration. Intermixed with the bales were found large, smooth stones, and inside each package a bag containing chips of a species of wood entirely foreign to cascara. The wood proved to consist wholly of portions of the wood of *Pseudotsuga Douglasii*, the false Douglas fir, which is one of the native conifers of the Pacific coast of America, from which region cascara comes. The brokers, a firm of high reputation, on being communicated with, replied that it was obviously a case of deliberate adulteration, all the more curious because deliveries had been made to several purchasers from the same shipload, and none of these had made any complaint. Correspondence with the shippers, who had the entire confidence of the brokers led to the conclusion that the adulteration was the work of some native worker desirous of making up his daily tally, and it was added that everything possible would be done to prevent "teelers" adulterating the bark in this way in future. The adulteration formed about 2 to 5 per cent of the entire bulk of the consignment, but, of course, in various packages the percentage was considerably higher.

(A communication to the Edinburgh Evening Meeting in the *Pharmaceutical Journal*, December 21st.)

PROTAMINE INSULINATE.

"Protamine insulinate (insulin retard) opens the door for fresh studies in the treatment of diabetes. With it the blood sugar can be kept

more nearly normal and any advantages that can occur from this fact ought to show within a few years. Already it is known that the diabetic patient who is carefully treated is the one who lives longest and is most free from complications. Can the diabetic patient with blood sugar controlled throughout the twenty-four hours do better still? The new insulin in its present form demands more intelligence in its use, it works too slowly for coma and too slowly to overcome the hyperglycemia of a large meal, and it has the disadvantage of not being stable for more than a few weeks. When properly employed it will replace the customary high fasting blood sugar of the diabetic patient with a normal blood sugar. Perhaps the wise patient with diabetes will employ the quickly acting old insulin in the morning with a heavy breakfast and the slowly acting new insulin at night before a light dinner, as Dr. Hagedorn's patients have done.

"This undoubtedly represents an important advance in the treatment of diabetes; it should be emphasized, however, that protamine insulinate is still a laboratory preparation and is not yet commercially available in this country. The compound must be prepared shortly before use, as it is stable at most for only a few weeks. It does not supplant ordinary insulin but serves as an adjunct to the latter; the two must usually be used in the same patient at different times of the day. Hagedorn and his associates point out that protamine insulinate is of no special value in those patients who are now adequately treated with insulin. But for those patients whose diabetes cannot be controlled satisfactorily with insulin alone, protamine insulinate is a valuable contribution—indeed the most valuable since the original discovery of insulin by the Toronto group."—From *Journal A. M. A.* of January 18th, page 218.

PRESCRIPTIONS BY PHONE.

The *Journal of the American Medical Association* for January 11th reports a case in which damages were assessed against a drug firm. While this case is not altogether based on prescription by telephone the question enters and it brings out the importance of having the signature of the physician and also the assurance of the physician that the prescription is correctly written and understood. An error in prescription practice may result in great financial loss and also reputation, therefore, pharmacists should be guarded in this practice.

MARIHUANA SMOKING.

The use of Marihuana was almost unknown, except in Mexico, adjacent states and a few localities elsewhere; addiction has spread in recent years, necessitating State legislation. Marihuana cigarettes with and without tobacco are used by addicts and the number has increased because the plant has spread by natural propagation.

PERSONAL AND NEWS ITEMS.

Marvin R. Thompson, professor of pharmacology at the University of Maryland, School of Pharmacy, has been named by *Modern Medicine* as one of the 25 men for making medical progress in 1935. Credit is given "for isolating and identifying as an alkaloid the new active, oxytocic principle of ergot; independently discovered by Adair, Davis, Rogers, Kharasch and Legault; also by the English investigators, Moir and Dudley."

Dr. Francisco Cignoli, member of the AMERICAN PHARMACEUTICAL ASSOCIATION in Buenos Aires, has published a report of the Twelfth International Pharmaceutical Congress recently held in Brussels. A report was published in the December JOURNAL, pages 1113–1119.

Lars Christianson, for forty-eight years a Fargo druggist, was honored on the eve of his eightieth birthday by a group of Fargo friends and business associates. Mr. Christianson, throughout his fifty-four years of residence in Fargo, has been active in civic affairs. He is one of the founders of St. Luke's Hospital, a founder of the First Lutheran Church, and for forty-four years he has been secretary of Concordia College, Moorhead, Minnesota. Mr. Christianson came to the United States from Norway in 1873.

Alden H. Emery, assistant chief engineer of the Experiment Stations Division, United States Bureau of Mines, has been appointed assistant manager of the American Chemical Society, a newly created office. Mr. Emery, who is 34 years old, is a native of Lancaster, N. H. He is a graduate of Oberlin College and Ohio State University, and is now secretary of the society's gas and fuel division. Dr. Charles L. Parsons, of Washington, and R. T. Baldwin, of New York, have been reëlected secretary-business manager and treasurer, respectively.

LUCIUS LEEDOM WALTON.

AN APPRECIATION.

In the passing of Lucius L. Walton after a busy and fruitful life of seventy years, American Pharmacy loses one of its noblemen. Courteous and friendly colleague of two generations of pharmacists; able examiner of thousands of candidates who have applied for registration as pharmacists in the Keystone State in the past 30 years; even-tempered and diligent worker in the committees, conferences and organizations of his beloved profession and in his church; polished, fair, inspiring and extraordinarily capable presiding officer in the Pennsylvania Pharmaceutical Association, the National Association of Boards of Pharmacy and the AMERICAN PHARMACEUTICAL ASSOCIATION; efficient secretary and later president of the Pennsylvania Board of Pharmacy; and leader in many activities within and outside of the profession which he graced—such is the memory, at least in part, which Dr. Walton leaves with those who knew him best.

To have known him intimately and to have come under the spell of his fine personality, his lofty idealism and his passion for service to pharmacy was in itself an education. His efforts to meet the problems created by the dual aspect of the drug industry in a day when cynicism toward the professional ideals of pharmacy was on the increase were always inspiring.

In his Presidential Address to the AMERICAN PHARMACEUTICAL ASSOCIATION in 1926 he referred to the qualifications of members of Boards of Pharmacy in the following words:

> "The persons who sit in judgment on the qualifications of those seeking admission to the profession of pharmacy, and administer the pharmacy laws, should be trustworthy and well qualified technically. They ought, also, to be free from all political, social or friendly interest. There is no duty which may fall to the lot of a pharmacist that requires such broad knowledge, careful discrimination, good judgment, keen appreciation of justice, and conscientious preparation, as that of examiner on a board of pharmacy."

All of these qualifications Lucius Walton possessed to an unusual degree. He was in the minds of many, the ideal Pharmacy Board member. The Proceedings of the National Association of Boards of Pharmacy and of District No. 2 of that Association are replete with practical suggestions for conducting the work of Pharmacy Boards and for elevating professional standards, emanating from the fertile mind and long experience of this Master of Pharmacy.

Dr. Walton's life-span paralleled some of the most significant developments and changes in American Pharmacy. He was a keen student of these changes and sought to adapt himself and the professional activities for which he was responsible to the changing order, without ever sacrificing the fundamental principles of good pharmaceutical practice to expediency.

Honors were bestowed upon Dr. Walton at various times during his career for services well rendered. Although richly deserved and without doubt greatly appreciated by the recipient, they were received in the spirit of humility which characterizes the truly great in every walk of life.

It was a treat to watch Lucius Walton preside over an assemblage such as the House of Delegates of the AMERICAN PHARMACEUTICAL ASSOCIATION. He knew parliamentary procedure as well as he knew pharmacy—and that is saying a great deal. He was never at a loss for the proper procedure to handle a difficult situation, and although very patient with those whose lack of knowledge of parliamentary law caused many a snarl and tangle in the management of some of our pharmaceutical meetings he frequently deplored the fact that many of those who accept appointment as presiding officers of our pharmaceutical associations do not take the trouble to acquaint themselves with the rules and by-laws under which they are expected to function. The tendency toward placing a premium on mediocrity sometimes resorted to in organizations in order to serve the ends of political expediency was always repugnant to Dr. Walton. He will be sorely missed in the councils of the National Association of Boards of Pharmacy, the AMERICAN PHARMACEUTICAL ASSOCIATION and the many other groups who leaned heavily upon his advice and experience.

No better sentiment can be found to close this brief and totally inadequate appreciation of one of America's most outstanding pharmacists, than the one which he himself uttered in commenting upon the departed in his Presidential Address of 1926:

"Death's transfiguration into the dimly outlined image of Eternal Love makes sacred our beloved. We are quickened to new resolves and impulses to better living by the blessed lives thus transmuted into our lives, and this birth in death tempers the sadness of the passing of our associates."

ROBERT P. FISCHELIS.

OBITUARY.

LUCIUS LEEDOM WALTON.

Lucius Leedom Walton, the 73rd president of the AMERICAN PHARMACEUTICAL ASSOCIATION, and member of the ASSOCIATION since 1904, died December 26, 1935, in the Clifton Springs Sanitarium, New York, after an illness of several months. Mr. Walton's health had not been good for several years.

There are events in the lives of all men that stand out above all other preferments. It

LUCIUS L. WALTON.

was the privilege of this writer to attend a testimonial given to Mr. Walton after he was elected President of the AMERICAN PHARMACEUTICAL ASSOCIATION. The citizens of Lycoming County came to do him honor and all the drug stores of Williamsport closed their stores so that proprietors and assistants could attend the dinner. The members of Lycoming Medical Society attached their signatures to an expression of professional regard in a beautiful memorial volume neatly embossed and attested by the seal of the Society. The papers of Williamsport expressed their high regard in editorials. The tributes paid the deceased evidenced the high regard in which he was held not only in his home town but throughout the state.

Mr. Walton was born at Clinton, N. J., July 8, 1865, son of Thomas Cooper and Jane Eliza Walton. Here he received his early education, and having chosen pharmacy for his life work he matriculated at the Philadelphia College of Pharmacy and was graduated in 1888 as one of the honor men in his class. He was manager of Barnum's Pharmacy in Danbury, Conn., for several years. In 1892 he opened a pharmacy in Williamsport, Pa., which he continued to operate until the time of his death.

Mr. Walton was appointed a member of the Pennsylvania Board of Pharmacy in 1906 and was a member until his demise; for seventeen years of his membership on the Board he was its secretary. He served the Pennsylvania Pharmaceutical Association as Treasurer, Secretary, Vice-President and President. In 1921 he was elected president of the National Association Boards of Pharmacy. For several years prior to his election he was chairman of the Executive Committee and after serving as its president he again was named chairman of the Executive Committee. In 1923 Mr. Walton was elected chairman of the House of Delegates and two years later president of the AMERICAN PHARMACEUTICAL ASSOCIATION.

In 1912 his Alma Mater conferred on him the Degree of Master in Pharmacy and in the same year the Pittsburgh College of Pharmacy honored him with the degree of Doctor of Pharmacy.

In 1890 Mr. Walton was married to Miss Cora Olive Brooks, of Williamsport, three children were born to them: Mrs. Louis Saalbach, Pittsburgh; Mrs. Lowell Budinger, Williamsport; Brooks Lamar, teacher at Hackensack, N. J. Mrs. Walton, who survives her husband, was a frequent attendant at the annual meetings of the AMERICAN PHARMACEUTICAL ASSOCIATION.

Mr. Walton was treasurer of the Grace Methodist Episcopal Church for twenty-five years. An editorial of one of the home papers, which is typical of all the others, closes with these words: "His name merits a high place in the list of Williamsporters of whom their city may well be proud."

WILLIAM L. STEARNS.

William L. Stearns, one of the oldest as well as one of the best known members of the Pharmacy Corps of the U. S. Public Health Service, died at the U. S. Marine Hospital, Stapleton, Staten Island, on January 17, 1936, where he had been under treatment for a number of months.

Mr. Stearns's career as a pharmacist in the Corps of the U. S. Public Health Service was a long and distinguished one. He was appointed in 1892 and remained on active duty until September of 1933, at which time he was retired. He served at the largest hospitals of the Service in the East, at Boston, New York, Dansville, N. Y., and at several of the principal southern quarantine stations during the period when yellow fever scourged that section of the country each summer. He rendered service at the special temporary quarantine camp, which was established at Sandy Hook, N. J., in the summer of 1892, when Asiatic Cholera was epidemic in several European ports.

He was for many years on duty in New York City in connection with Medical Purveying Depot and Supply Service.

He was a graduate of the Massachusetts College of Pharmacy. In 1930 he was commissioned as a pharmacist officer of the United States Public Health Service in accordance with the provisions of the Parker Bill.

He was buried in Lynn, Massachusetts.—H.

J. ALLEN TAILBY.

J. Allen Tailby—of the Tailby-Nason Company, Cambridge, Mass.—member of the AMERICAN PHARMACEUTICAL ASSOCIATION, died January 10, 1936, aged 70 years.

Mr. Tailby was born at Hunters Point, New York, February 1, 1866. The family removed to Wellesley, Massachusetts, when he was three years of age. He attended the elementary schools in Wellesley and graduated from the Chauncy Hall School of Boston. Following a special course in chemistry at Clark University, Worcester, he entered the Massachusetts College of Pharmacy and graduated from the college May 24, 1888. He was one of the founders, in 1905, of the Tailby-Nason Company of Massachusetts and was president and a director of the company until June 1910, when it was reorganized as the Tailby-Nason Company of Maine. He continued to serve as a director of the Maine corporation until the time of his death.

The deceased had served on various town committees and at the time of his death was *Chairman* of the Board of Health of Wellesley. He was a member of the Boston Druggists' Association, the American Chemical Society and also of the Contact Committee of the American Pharmaceutical Manufacturers' Association.

(*Continued on page 88.*)

SOCIETIES AND COLLEGES.

CONVENTIONS.

The 59th annual Convention of the Pennsylvania Pharmaceutical Association will be held at the Bellevue-Stratford Hotel, Philadelphia, June 16th, 17th, 18th. The N. A. R. D. will hold its annual meeting at the William Penn Hotel, Pittsburgh, September 21st, 22nd, 23rd, 24th, 25th.

The Kansas Pharmaceutical Association will convene in the Hotel Jayhawk, Topeka, April 13th to 16th.

The Missouri Pharmaceutical Association meets in St. Joseph, April 21st to 23rd.

Oklahoma Pharmaceutical Association holds its annual session at Enid, April 21st to 23rd.

Iowa Pharmaceutical Association meets in Davenport, February 4th to 6th.

Nebraska Pharmaceutical Association has selected Hotel Fontenelle as headquarters, February 18th to 21st. The Northwest Drug Show will be held in the Auditorium, a few blocks away from the headquarters.

Arkansas will hold its annual convention June 9th in Little Rock, at the Marion Hotel.

The Federal Wholesale Druggists' Association will hold its mid-winter meeting in the Hotel Roosevelt, New York, February 25th–27th. The first day will be devoted to a joint meeting of active (coöperative wholesale) and associate (manufacturing) members for an open discussion of trade subjects.

The Canadian Pharmaceutical Association will meet in Bessborough Hotel, Saskatoon, Sask., during the week of August 17th.

The Purdue Pharmacy Extension Department was instituted six years ago to assist druggists of the state who wish to apply to their stores some of the principles and methods studied and promoted by the Department. The annual druggist business conference will be held Marth 25th and 26th.

JAPANESE PUBLIC HEALTH INSTITUTE.

The Rockefeller Foundation has provided a building for the Japanese Public Health Institute. The proposed building will be a five-story reënforced concrete one. The Institution will be used for the training of health technicians and officials in charge of administration affairs.

OFFICERS OF TEXAS PHARMACEUTICAL ASSOCIATION.

B. B. Brown, Dallas, was elected president of the Texas Pharmaceutical Association by its executive committee to succeed C. C. Harris, Houston, who resigned recently. Festus Pierce, Corsicana, and W. V. Paul, El Paso, were named vice-presidents. Mr. Pierce will be legislative committee chairman, assisted by E. E. Weaver, Fort Worth, and Carter Summers, San Antonio.

Plans to entertain the AMERICAN PHARMACEUTICAL ASSOCIATION convention in Dallas in August were discussed. Walter D. Adams was named Local Secretary.

San Antonio was selected as the convention city for the State meeting, June 8th to 11th, with Roy Phillips in charge of the drug show.

OFFICERS OF ARIZONA ASSOCIATION.

Since the recent convention of the Arizona Pharmaceutical Association, held during October in Tucson, there has been a change in the roster of its officers. Newell W. Stewart, of Phoenix, assumes the office of *First Vice-President*, following the resignation of Andrew P. Martin; L. R. Johnson, of Tucson, is *Second Vice-President;* Fred W. Moore, of Flagstaff, is the *President;* Lawrence Evans, Jr., Phoenix, is the *Executive Secretary. Executive Committee:* Russell Meadows, J. B. McDonald, J. B. Ryan.

SOCIETY FOR THE HISTORY OF PHARMACY.

The annual meeting of the Society for the History of Pharmacy will take place in Stuttgart; definite date has not been fixed but it will be held in June.

The new officers of the Society are as follows: *President,* Dr. L. Kofler, Innsbruck, Germany; *Vice-President,* Dr. J. A. Haefliger, Basel, Switzerland; *Chairman of Publicity,* Dr. Fritz Ferchl, Mittenwald, Germany; *Librarian,* Dr. Alfred Adlung, Berlin, Germany; *Treasurer and Director,* Dr. Hans Hoesel, Berlin, Germany.

SOUTH DAKOTA.

The power of the South Dakota State Board of Pharmacy to reject applications for Pharmacy license was upheld in a Circuit Court decision rendered by Judge L. L. Fleeger. The case arose as a result of a refusal to license an applicant. Counsel for the plaintiff sought to prove the unconstitutionality of part of the law. The Judge's decision supports the State Board of Pharmacy.

DEFINES "INDUSTRIAL ALCOHOL USES."

The Federal Alcohol Administration Act, passed at the last session of Congress, covers alcohol and distilled spirits for non-industrial use. The regulations just issued define what type of spirits are to be regarded as for industrial use, hence exempt from the provisions of the law. These industrial uses are:

1. Use of tax-free alcohol by any governmental agency, state or federal, or any scientific university or college of learning, or by any laboratory exclusively in scientific research, or by any hospital or sanatorium.

2. Use of alcohol or other distilled spirits of wine which has been lawfully denatured or otherwise rendered unfit for beverage use.

3. Uses of distilled spirits or wine for experimental purposes, and in the manufacture of medicinal, pharmaceutical or antiseptic products, including prescriptions compounded by retail druggists; of toilet products; of flavoring extracts, syrups or food products, or of scientific, chemical, mechanical or industrial products, provided such products are unfit for beverage use.

The new regulations continue in effect the old regulation which provided that distilled spirits in containers of a capacity of one wine gallon or less, except anhydrous alcohol and alcohol which may be withdrawn tax free under the internal revenue laws, will be deemed to be for non-industrial use, hence subject to the act.

VIRGINIA PHARMACEUTICAL ASSOCIATION.

Virginia Pharmaceutical Association will hold its mid-year meeting at Richmond, John Marshall Hotel, February 11th and 12th.

The annual meeting will be held on board the Steamship Reliance, sailing from Norfolk to Bermuda and return, June 14th–19th.

DEDICATION OF REMINGTON MEMORIAL LABORATORIES.

In connection with the annual conferences and exhibits of the Philadelphia College of Pharmacy and Science the Remington Memorial Laboratories were dedicated January 31st. The donors are alumni of the College—Josiah K. Lilly (1882), Eli Lilly (1907); the presentation was made for them by Edward J. Hughes of Eli Lilly & Co., and accepted for the College by Dean Charles H. LaWall.

The control division of the laboratory is on the second floor; "it is for the application of the official physical, chemical and botanical tests and assays used in the examination of ingredients and finished chemical and pharmaceutical products." The manufacturing division is on the ground floor. Here is located apparatus used in the pharmaceutical manufacturing processes.

A professional symposium and exhibit was part of the day's program with demonstrations of the relationship of pharmacy, chemistry, bacteriology and biology, in the efforts to cure disease and maintain health. References to the addresses and the exhibits will have to be deferred.

The program also included the presentation of the "Procter Award" for 1936 to Dr. William Boswell Castle, assistant professor of Medicine at Harvard Medical College, in recognition of an outstanding contribution to medicine and pharmacy. The subject of the recipient's address was "New Developments in the Products for the Treatment of Pernicious Anemia."

Chairman E. Fullerton Cook spoke on "Significant Features of the New Pharmacopœia," and Secretary Adley B. Nichols discussed "The New National Formulary."

Dr. Owen Stanley Gibbs, M.B., Ch.B., recently was appointed professor of pharmacology and chief of the division of pharmacy and materia medica of the University of Tennessee.

The following were elected officers of the Association of Official Agricultural Chemists: *President*, H. H. Hanson, State Board of Agriculture, Dover, Del.; *Vice-President*, C. C. McDonnell, Washington; *Secretary-Treasurer*, W. W. Skinner, U. S. Bureau of Chemistry and Soils, Washington; *Members of the Executive Committee:* H. R. Kraybill, La Fayette, Ind.; W. S. Frisbie, Washington, D. C.; C. L. Hare, Auburn, Ala.; F. E. Blanck, Washington, D. C.

Dr. P. A. Foote, of the University of Florida, was the principal speaker at the annual banquet of the Volusia County Pharmaceutical Association to the physicians, at Daytona, on January 22nd. The subject was "Coöperation."

GERMAN APOTHECARIES WILL VISIT THE UNITED STATES.

The tour of the German Apothecaries scheduled for a year ago has been arranged for April of this year and cities thus far named in the itinerary are New York, Buffalo, Detroit, Chicago, Philadelphia and Washington. The AMERICAN INSTITUTE OF PHARMACY is listed; the party will reach Washington on April 26th.

LAW MAKING BY MODEL.

The Oil Paint and Drug Reporter, of January 27th, closes an editorial with the following paragraph: "The fixing of a resale price by contract between manufacturer and dealer is valid in this State. It would not be in Montana, whose constitution specifically forbids the making of such contracts. Constitutional provisions in Idaho and New Hampshire may be applied with similar effect; although Idaho has a law (enacted in 1911) making it illegal to sell any article 'at less than its fair market value.' The constitutions of five or six other States have provisions that make even contractual price-fixing difficult if not impossible. To make an effective law much more than a model is necessary."

SENATOR TYDINGS REVISES FAIR TRADE MEASURE.

On January 27th, Senator Millard F. Tydings introduced a revised draft of the fair trade measure, S. 3822, the provisions of which are:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That Section 1 of the act entitled, "An act to protect trade and commerce against unlawful restraints and monopolies," approved July 2, 1890, is amended by striking out of the period at the end of the

first sentence thereof and inserting in lieu thereof a colon and the following: "Provided, That nothing herein contained shall render illegal contracts or agreements prescribing minimum prices or other conditions for the resale of a commodity which bears, or the label or container of which bears, the trade-mark, brand or name of the producer of such commodity and which is in free and open competition with commodities of the same general class produced by others, when contracts or agreements of that description are lawful as applied to intrastate transactions, under any statue, law or public policy now or hereafter in effect in any State, Territory or the District of Columbia in which such resale is made, or to which the commodity is to be transported following such resale, and the making of such contracts or agreements shall not be an unfair method of competition under Section 5, as amended and supplemented, of the act entitled 'An act to create a Federal Trade Commission, to define its powers and duties, and for other purposes,' approved September 26, 1914."

COPELAND DRUG BILL INTRODUCED IN HOUSE.

Apparently with an idea of forcing action in the House on food and drug legislation, Representative Martin J. Kennedy of New York, in a surprise move January 13th, introduced in the House the Copeland bill in the form in which it passed the Senate. The Kennedy bill is known as H. R. 10124.—*Drug Trade News.*

THE OPINION INVALIDATING PRICE FIXING IN NEW YORK LAW.

COURT DECISION BASED ON SECTION 2.

"Section 2 is that part of the law which is questioned in this case. The interpretation given below to this section and by all the parties apparently is that it attempts to accomplish just what the plaintiffs claim for it, as stated in the complaint and as given above. But for this we would have grave doubts whether the Legislature ever intended to fix the price of books after they had been purchased in the open market under no agreement as to resale price. Thus it is possible to read Section 2 as referring to the contract made under Section 1, or, as binding on those books like an equitable servitude which had been parted with under a contract as to resale price.

"However, for the purpose of this appeal we confine ourselves to the question of the constitutionality of the statute as construed by the parties and the court below and treat this section as allowing book price-fixing in the absence of contract made by the purchaser or his agents.

"We agree with Special Term that, if this be its meaning, the law is unconstitutional. That the States cannot fix the selling price of any and all commodities has been settled. (Williams Co. *vs.* Standard Oil Co., 278 U. S. 235; Tyson & Bro. *vs.* Banton, 273 U. S. 418; Wolff Co. *vs.* Industrial Court, 262 U. S. 522; Straus *vs.* Victor Talking Mach. Co., 243 U. S. 490.)

"Books, at least these books, are not 'affected with a public interest' any more than theatre tickets; no emergency has yet arisen in literary publications, and the business is not such as comes within the classes which must submit to rate fixing."

BOERNER'S PHARMACY WEEK WINDOW.

Edward S. Rose, of Iowa City, is doing honor to the memory of his predecessor in Boerner's Prescription Pharmacy. The founder of the pharmacy, Emil P. Boerner, was an honored member of the profession and of the A. PH. A.

The following explains the window in part:

"Title—Ethics of Pharmacy—based on the Code of Ethics of the AMERICAN PHARMACEUTICAL ASSOCIATION, which is divided into three parts—

1. The Pharmacist and the Public
2. The Pharmacist and the Physician
3. Relation—Pharmacists to Each Other.

"On display—

"Certificates of Registered Pharmacists Membership in AMERICAN PHARMACEUTICAL ASSOCIATION. Postal pictures of AMERICAN INSTITUTE OF PHARMACY. U. S. P.—N. F.—U. S. Dispensatory. Eighty U. S. P. and N. F. preparations.

"Boerner's Pharmacy subscribes to the Code of Ethics of the AMERICAN PHARMACEUTICAL ASSOCIATION."

CONSIGNMENT SALES BANNED.

Administrator Franklin C. Hoyt recently announced that any sale of alcoholic beverages in which title is not transferred at the time of shipment and which does not involve some form of settlement, in cash or on open account, is unlawful. Returns made for ordinary commercial reasons arising after the merchandise is sold are excepted.

BOOK NOTICES AND REVIEWS.

A Textbook of Anatomy and Physiology. By JESSE FEIRING WILLIAMS, M.D. Professor of Physical Education, Teachers College, Columbia University, New York City. Fifth edition, revised, with 416 illustrations, 31 in color. Published by W. B. Saunders Company, Philadelphia, Pa., 1935. Price $2.75.

It is peculiarly difficult to obtain satisfactory textbooks in physiology to be used in connection with courses in pharmacy schools. The general tendency appears to be to use a book prepared or intended for use in pre-medical courses, omitting certain sections on the ground that they are "unduly complicated." A number of physiology texts have been prepared for the presentation of general physiology, but these drift into the realms of speculation, philosophy or statistics. "This book presents the essentials of anatomy and physiology for students of the practical arts—nursing, physical education, physiotherapy, occupational therapy, and household arts." It is arranged to serve the needs of students of anatomy and physiology outside the medical field. In the fifth edition the original plan has been conserved. By 416 illustrations, 31 in color, the essential features of the text are clarified. The book lays a fundamental stress on the importance of the cell: the embryological formation, the nature of the epithelial, connective, muscular, vascular and nervous tissue are pointed out in connection with practical use in the body. The nature and formation of the skeleton is followed by the insertion of the muscles, their operation by means of the nervous system, their maintenance by the circulatory and respiratory systems, and their nutrition by the digestive system. Finally, the excretory system is discussed, with its job of removing waste material. Chapters on the reproductive system, the endocrines and the special senses are then presented. A host of useful and impressive facts, statistics and applications are presented. Each chapter closes with a series of practical exercises and test questions, which greatly facilitate presentation to students. A limited number of references are given. One of the outstanding features is the 30-page glossary.

This textbook will serve a useful purpose for reference by teachers and students, as well as for a text for anatomy and physiology.—JAMES C. MUNCH.

List of Trade Names.—A Supplement to the List of Trade Names registered with the American Drug Manufacturers' Association and the American Pharmaceutical Manufacturers Association, is now ready for distribution. The main list was released August 1, 1934, and the present supplement represents additions, corrections and deletions up to August 1, 1935. The purpose of these lists is to furnish information in the preliminary consideration of new trade names. It is the desire of the Associations that the booklets receive the widest possible circulation, not only among members, but among all others interested in this important field, including firms and individuals identified with allied organizations, trade-mark attorneys and association trade-mark bureaus.

The principal list was offered at fifty cents; the price of the supplement is twenty-five cents a copy. However, if the two publications are ordered together, they will be furnished for a total of fifty cents. Copies may be obtained from Carson P. Frailey, Executive Vice-President and Secretary, American Drug Manufacturers' Association, 507 Albee Building, Washington, D. C., or from Clarence W. Warner, Secretary, American Pharmaceutical Manufacturers Association, 250 High Street, Newark, New Jersey. Check or coin should be forwarded with order.

GEORGE M. BENNETT.

George M. Bennett, member of the AMERICAN PHARMACEUTICAL ASSOCIATION, and veteran member of the Illinois Pharmaceutical Association, its treasurer from 1919 to 1935, and a long-time Urbana druggist, died in Carle hospital, Urbana, December 17th.

Mr. Bennett was born September 1, 1863, in Champaign, Ill. In 1887, following school days and an apprenticeship, he bought an interest in a drug store in Urbana and formed a partnership with his brother-in-law, E. N. Knowlton. He owned and conducted this pharmacy until the time of his death.

In 1911, Mr. Bennett was presented with a silver loving cup as a distinguished citizenship award by the Association of Commerce.

Mr. Bennett was a member of the masonic bodies. He was married in 1890 to Miss Emma C. Yanos, who survives him.